SITE: FL. Phosphate Initiative
BREAK: 17.8
OTHER: v.60

STATE OF COLORADO

Bill Owens, Governor
Jane E. Norton, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory and Radiation Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 (303) 692-3090
Located in Glendale, Colorado

http://www.cdphe.state.co.us

Colorado Department
of Public Health
and Environment

June 8, 2001

Dear Interested Citizens:

Enclosed is the Proposed Plan for the Summitville Mine Superfund site. The following information is a quick summary of the more detailed plan. A PUBLIC MEETING has been scheduled for JUNE 20TH AT THE CAPULIN COMMUNITY CENTER - 7 P.M. At this time we will be requesting your comments on the alternatives for cleanup of the site.

At every Superfund site a process which is prescribed by law calls for a thorough study of the problems at the site and a report called the Remedial Investigation/Feasibility Study. Using the information in the Feasibility Study, the Colorado Department of Public Health and Environment (CDPHE) and the Environmental Protection Agency (EPA) put forth several alternatives for cleaning up the site. This is called the Proposed Plan. The CDPHE and EPA brings this Plan to the public for their suggestions and comments. A preferred alternative and the rationale for that choice is listed in the Proposed Plan document.

What is in the Proposed Plan?

It contains information on several important aspects of the plan, including: a) opportunities for public involvement, b) site background, c) site characteristics, d) risks presented by the site, e) contaminants of concern, f) goals for a cleanup plan, and g) a list of the alternatives for cleanup. The alternatives considered include the options and costs of this work and are presented in a chart that compares the alternatives. CDPHE and EPA identify a preferred alternative which is highlighted for your consideration.

At the Summitville Mine site, EPA and CDPHE looked at numerous possibilities for final cleanup of the site. Many proved to be impractical and were screened out. Six possibilities remained for serious consideration. All of the alternatives, with the exception of the "no action" alternative, have several common factors. The alternatives hope to accomplish the goal of controlling and treating contaminated surface and ground water, re-establishing a viable fishery, ensuring stable dams and slopes, stopping erosion at the site, and controlling air-borne contaminants. This Proposed Plan is for the final work being considered at the site. Much work has already been done to get the site ready for this step.

What are the Alternatives?

Each of the alternatives looked at some form of water treatment, water diversion systems, and an impoundment storing contaminated water for treatment. The water treatment system varied from continued use of the current system to putting in a whole new system downstream of a new larger storage impoundment. The alternative which the agencies prefer builds a new water treatment plant, maintains an impoundment for storage of contaminated water, upgrades to Wightman Fork Diversion and site ditches, and rehabilitation of the Reynolds and Chandler Adits. The cost for the preferred alternative is about $75,000,000 to be spent over 100 years. This includes capital costs and long-term operation and maintenance costs. An engineering design will be done after a Record of Decision is published which will give much more detail on how the plan is to be implemented.

What's Next?

After citizens review the Proposed Plan, EPA and CDPHE will make a final selection from one of the alternatives listed in the plan. A Record of Decision (ROD) will then be signed, design work will begin, and bids will be let to do the actual work.

We want to hear what you think of this plan. The attached Proposed Plan document lists where you can find records from the site and where to send your comments. Thank you for your interest in this site. If you have any questions, call me at 1-888-569-1831.

Sincerely,

Austin Buckingham
Summitville Mine Superfund Site
State Project Manager

enclosure

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Colorado Department of Public Health and Environment

PROPOSED PLAN FOR SUMMITVILLE MINE

Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division
Denver, Colorado
June 2001

On-Site Study Area - Operable Unit 5
Summitville Mine Superfund Site
Rio Grande, Colorado

ANNOUNCEMENT OF PROPOSED PLAN

This ***Proposed Plan***[1] identifies the ***preferred alternative*** for ***Operable Unit*** 5, final remedial action at the Summitville Mine Superfund site (site). The purpose of the Proposed Plan is to inform and solicit the views of citizens on the preferred alternative. To facilitate public input, the Proposed Plan reviews the site background and provides a description of the site characteristics, discusses interim remedial actions performed at the site and their effectiveness, summarizes the alternatives developed to address Operable Unit 5 and provides rationale for selection of the preferred alternative. This document is issued by the Colorado Department of Public Health and Environment (CDPHE), the lead agency for the site-wide ***Remedial Investigation*** and ***Feasibility Study***, and the U.S. Environmental Protection Agency Region 8 (EPA). A ***Record of Decision*** for Operable Unit 5 is expected in fall 2001.

*- - - **Preferred Alternative** - - -*

- ✔ New water treatment plant/flexible treatment season
- ✔ Impoundment for storage of contaminated water
- ✔ Upgrade of Wightman Fork Diversion and site ditches
- ✔ Rehabilitation of Reynolds and Chandler Adits

The CDPHE and EPA prepared this Proposed Plan to fulfill the requirements of Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and 40 CFR § 300.430(f)(2) of the ***National Oil and Hazardous Substance Pollution Contingency Plan*** (NCP). Under these regulations, the public is provided a 30-day period to submit comments on this Proposed Plan. Detailed information on site contamination and clean-up alternatives is provided in the Draft Remedial Investigation and Draft Feasibility Study reports. These and other site documents in the ***Administrative Record*** are available at the information repositories listed in the *Highlight* section.

- - - HIGHLIGHT - - -

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

Public Comment Period: June 13 through July 11, 2001

Public Meeting:
June 20, 2001 at 7:00 p.m.
Community Center
Capulin, Colorado

Send Written Comments to Either of the Following:
Ms. Austin Buckingham (State Project Manager)
CDPHE (HMWMD-RP-B2)
4300 Cherry Creek Drive South
Denver, CO 80246-1530
e-mail: austin.buckingham@state.co.us

Mr. Victor Ketellapper (EPA Remedial Project Manager)
U.S. EPA (8EPR-SR)
999 18th Street, Suite 500
Denver, CO 80202-2466
e-mail: ketellapper.victor@epamail.epa.gov

Information Repositories:
Del Norte Public Library
790 Grand Avenue
Del Norte, CO 81131

U.S. Department of Agriculture Service
Conejos County Natural Resources Conservation Service
15 Spruce
La Jara, CO 81140

Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division
Records Center, Room B-215
4300 Cherry Creek Drive South
Denver, CO 80246-1530

U.S. Environmental Protection Agency
Region 8 Superfund Records Center
999 18th Street, Suite 50
Denver, CO 80202-2466

1 Words in ***bold italics*** are defined in the glossary.

While the Proposed Plan identifies the preferred alternative, new information or arguments presented to the CDPHE and EPA during the public comment period could result in the selection of a final site-wide remedial action that differs in some way from the preferred alternative presented in this Proposed Plan and detailed in the Feasibility Study. Consequently, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan. Verbal or written comments may be submitted during the public meeting, or written comments may be submitted to the CDPHE or EPA Project Managers. Upon timely request, the public comment period may be extended an additional 30 days. Such requests must be made in writing to the CDPHE or EPA Project Managers, postmarked no later than July 11, 2001.

SITE BACKGROUND

The Summitville Mine site is located in the San Juan Mountains of south central Colorado (Figure 1), about 40 miles west of Alamosa, Colorado. Mining in the Summitville District has occurred since the 1870s, when gold was discovered on South Mountain. Shortly thereafter, miners began driving shafts and adits to access gold-bearing veins. The Reynolds Adit (Figure 2), the lowermost adit in South Mountain, was completed about 1906 to serve as an ore-haulage tunnel and to de-water the upper mine workings. Mining and ore processing operations occurred intermittently in the Summitville Mining District through 1992.

During the most recent mining operations (1984 through 1992), the South Mountain mineral reserves were developed as a large tonnage, open-pit operation. Gold and silver were extracted from the ore in a large, on-site Heap Leach Pad. ***Acid Mine Drainage*** (AMD) and cyanide releases from the open-pit mine and Heap Leach Pad operation adversely impacted downstream water users and aquatic life in the Alamosa River and San Luis Valley. The mine operator declared bankruptcy in December 1992 and the EPA assumed control of the site as part of an Emergency Response Removal Action. The site was added to the Superfund ***National Priorities List*** on May 31, 1994.

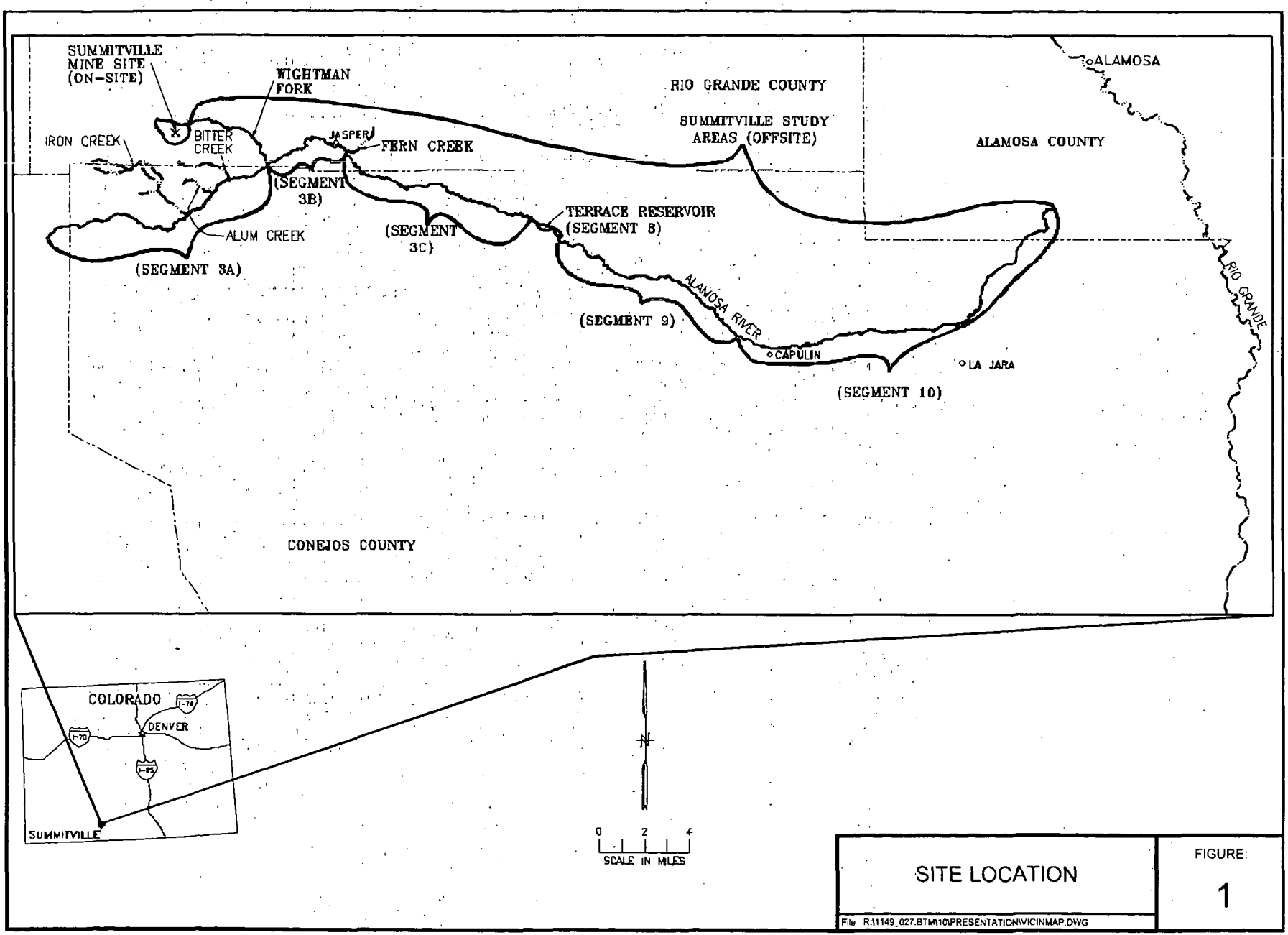
Releases of AMD from various sources in the Summitville Mining District have impacted surface water and sediments in the Alamosa River system downstream of the site (Figure 1). Copper is the primary contaminant of concern. In addition to impacts from the Summitville Mine site, the Alamosa River quality is degraded due to drainage from naturally mineralized areas that contribute metals and acidity (low pH) to the surface water system. Metals concentrations have decreased significantly in the Alamosa River downstream of Wightman Fork with the implementation of emergency and interim remedial actions at the Summitville Mine site. However, metals concentrations in the Alamosa River continue to exceed State of Colorado stream standards. Alamosa River water is exclusively used for agriculture purposes in the San Luis Valley. While soils in the San Luis Valley irrigated with Alamosa River water have been impacted, this impact has been demonstrated to not limit or otherwise adversely affect crop production capacity.

SITE CHARACTERISTICS

The terms "site" and "on-site" include the 1,231 originally permitted acres of the Summitville Mine. Areas outside the mine boundary, or "offsite," and potentially impacted by contaminants originating from the site, fall within the "Summitville study area" (Figure 1). The mine site contains approximately 572 acres of disturbed area, most of which is positioned on the northeastern flank of South Mountain (Figure 2). Elevations at the site range from 11,150 feet to approximately 12,300 feet at the highest extent of mine workings. The site is bounded by Wightman Fork to the north, Cropsy Creek to the south and east, and the mine workings of the South Mountain to the southwest. The annual total precipitation for Summitville averages about 40 inches. The annual total snowfall for the site averages 344 inches, or approximately 29 feet. The mine site is privately owned, but located within the U.S. National Forest system lands that make it desirable for recreation such as snow skiing, hiking, camping, hunting, and livestock grazing. However, access to the site is currently restricted to authorized personnel only.

Ground water contamination as a result of site activities is generally limited to the site itself. Metal contaminants frequently detected in ground water include copper, iron, manganese, and zinc (primary metals), and others to a lesser extent, and the pH is generally less than 4. Contamination of bedrock ground water in the mine pit area is due to the presence of highly mineralized and altered rock of the ore body, and was exacerbated during open-pit mining. Ground water quality generally improves downgradient of the mine pits and with depth. Groundwater contamination also occurs in the mine pool that occupies the underground workings and in the processed ore of the Heap Leach Pad. Minimal impact to alluvial aquifers downstream of the site has occurred.

The majority of surface water flow originates as precipitation runoff from snow melt during the spring, and from rainfall during the summer months. Acid mine drainage from the site is routed to the Summitville Dam Impoundment where it is stored for eventual treatment. ***Metal loading*** to the Summitville Dam Impoundment is greatest in the spring as a result of the high loading from surface water inputs (e.g., North Waste Dump and mine pits) and ground water inputs (e.g., Reynolds Adit and French Drain). Surface water quality exiting the site has improved in response to remedial and emergency actions performed by the EPA. The pH values measured at the downstream site boundary are increasing, and metals concentrations are decreasing. However, AMD that is not collected contributes to the metals load of Wightman Fork. Principal sources of surface water loading to Wightman Fork include site runoff, seepage, releases of untreated water from the Summitville Dam Impoundment, discharge from the Water Treatment Plant, and Cropsy Creek. Air dispersion from the site has had minimal impact on the environment.


SUMMITVILLE
MINE SITE
(ON-SITE)
WIGHTMAN
FORK
RIO GRANDE COUNTY
SUMMITVILLE STUDY
AREAS (OFFSITE)
ALAMOSA
ALAMOSA COUNTY
IRON CREEK
BITTER
CREEK
JASPER
FERN CREEK
(SEGMENT
3B)
TERRACE RESERVOIR
(SEGMENT 8)
ALUM CREEK
(SEGMENT
3C)
(SEGMENT 3A)
ALAMOSA RIVER
RIO GRANDE
(SEGMENT 9)
CAPULIN
LA JARA
(SEGMENT 10)
CONEJOS COUNTY
COLORADO
I-76
DENVER
I-70
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SUMMITVILLE
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SCALE IN MILES
SITE LOCATION
FIGURE:
1
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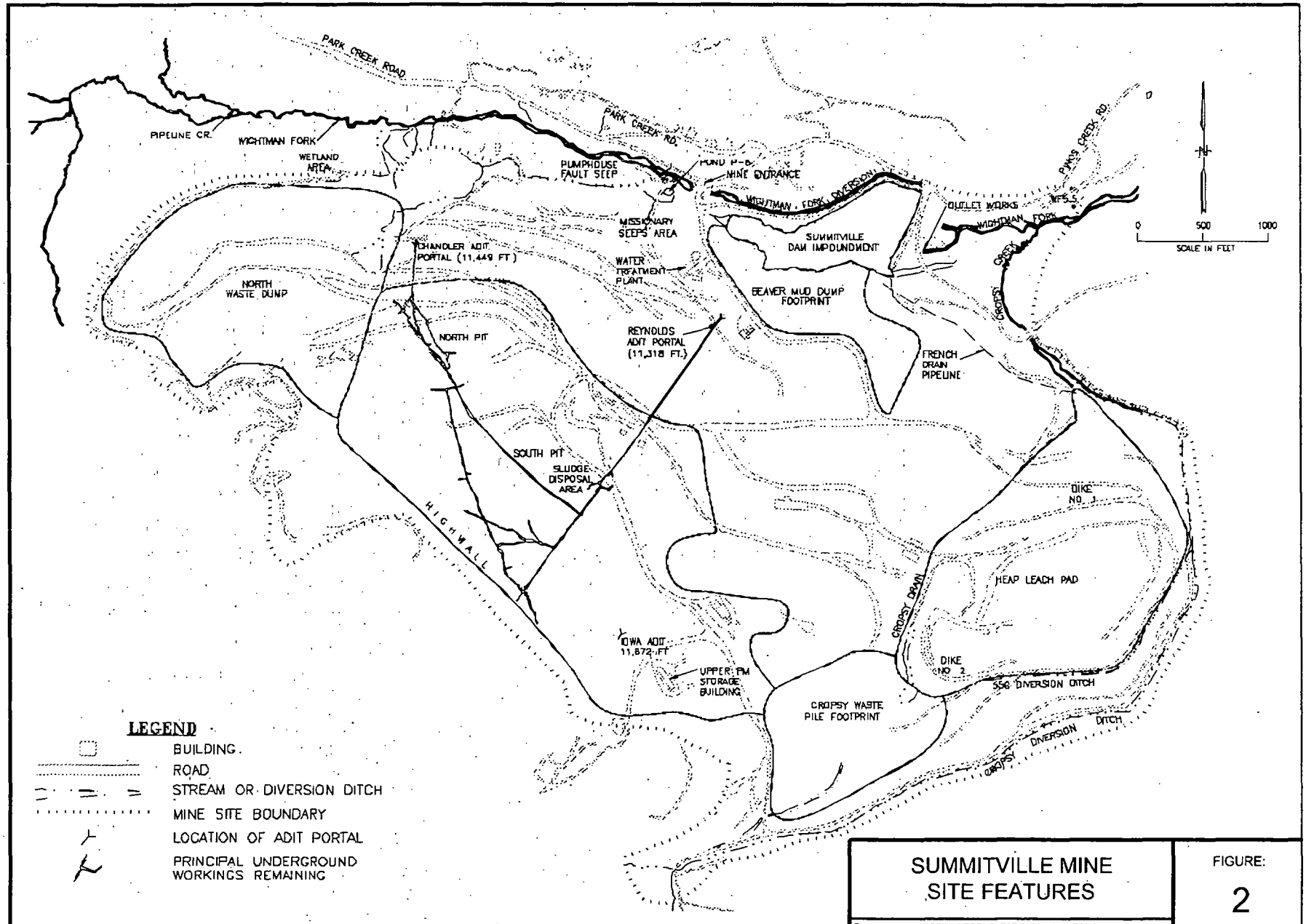

SUMMITVILLE MINE SITE FEATURES

FIGURE: 2

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EMERGENCY RESPONSE AND INTERIM REMEDIAL ACTIONS

Emergency response and interim remedial actions implemented by the EPA and the CDPHE at the site are in various stages of completion. Interim remedial actions were implemented by the issuance of ***Interim Records of Decision*** in 1994. The following summarizes the status for each.

Reynolds/Chandler Adit Plugging: When the EPA assumed control of the site in 1992, the Reynolds Adit was the largest contaminant source at the site. Consequently, it was decided to plug the Reynolds Adit. Because the Chandler Adit was connected to the Reynolds Adit, it too was plugged. Plugging of the adits has been effective in reducing the copper load from these sources by 93 percent.

Water Treatment (Operable Unit 0): In December 1992, water treatment actions were complicated by the variety of waste streams that required treatment. Consequently, water treatment was initially performed at several locations using a variety of processes. The goal of Operable Unit 0 was to consolidate water treatment during interim remedial activities, to equalize flow, and to improve water quality. Water treatment has been consolidated into one central facility. The current Water Treatment Plant uses a lime precipitation process to remove metals. On-going efforts to improve water treatment efficiency continue.

Heap Leach Pad Detoxification/Closure (Operable Unit 1): Detoxification of cyanide in the Heap Leach Pad was performed through a rinsing program from 1993 through 1996. The goals of the detoxification were to eliminate or minimize Heap Leach Pad impacts to the Alamosa River, and to eliminate or minimize the need for continued water treatment at the Heap Leach Pad. The rinsing program has removed about 98 percent of the liquid-phase cyanide from the Heap Leach Pad. The Heap Leach Pad was capped during the 1997 and 1998 construction season and vegetated.

Excavation of Cropsy Waste Pile, Beaver Mud Dump, and Summitville Mine Dam/Mine Pit Closure (Operable Unit 2): In October 1993, the EPA and the State issued a non-time critical removal action plan to remove, reduce, stabilize, and/or contain significant manmade sources of AMD from the site to prevent further releases. Four sulfide-metal bearing waste rock deposits and drainage areas were identified in the removal action plan: the Cropsy Waste Pile; the Beaver Mud Dump; the Summitville Dam Impoundment (formerly the Cleveland Cliffs Tailings Pond); and the North and South Mine Pits (Figure 2). Over five million cubic yards of mine waste materials from these areas have been excavated and placed in the mine pits. Closure of the mine pits consisted of lining the pit bottoms, and filling the pits with waste rock. Capping of the pits was completed in late 1995.

South Mountain Ground Water (Operable Unit 3): This non-time critical removal action consisted of characterizing the hydrogeology of South Mountain groundwater. This Operable Unit was incorporated into the site-wide Remedial Investigation/Feasibility Study in the late 1990s.

Site-Wide Reclamation (Operable Unit 4): Site-wide reclamation has been implemented in multiple phases over several years and is expected to be completed in 2001. Approximately 300 acres of disturbed land will ultimately be reclaimed at the site under Operable Unit 4. The goals of reclamation are to remove, reduce, stabilize, and/or contain non-point sources of AMD to prevent further releases from the site. Reclamation has involved reconfiguring disturbed areas to improve slope stability and moisture retention, and to reduce soil erosion. Amendments needed to produce a topsoil capable of promoting and sustaining plant growth have been added to the soil. Reclamation is anticipated to be 95 percent successful at reducing AMD.

SUMMARY OF SITE RISKS

Risks posed to humans by site releases have been identified in two separate risk assessment reports: the 1995 ***Baseline Human Health Risk Assessment*** and the 1997 ***Public Health Assessment*** issued by the Agency for Toxic Substances and Disease Registry. These evaluations have classified the site as having no apparent public health hazard based on ingestion and dermal contact exposure routes.

As a result of contaminant releases from Summitville, aquatic life in the Alamosa River was decimated. No sustained fish population occurs and the final remedy addresses this issue. Risks to ecological and agricultural receptors have been identified in two ***Ecological Risk Assessment*** reports: the 1995 Tier 1 Ecological Risk Assessment and the 2000 Tier 2 Ecological Risk Assessment Addendum. The Tier 2 Ecological Risk Assessment Addendum integrated and updated the results of the Tier 1 Ecological Risk Assessment. The Tier 2 Ecological Risk Assessment found that ***aquatic biota*** are at significant risk in Wightman Fork, the Alamosa River, and Terrace Reservoir. Risks are primarily driven by exposure to copper; however, exposure to zinc, iron, and low pH also contribute to risk. Some improvement in the aquatic biota community has been recently measured, but it remains severely impaired. The quality of the habitat for aquatic biota in the Alamosa River is lower than optimal, but habitat does not appear to be a limiting factor for fish or aquatic biota under current conditions. Aquatic biota accumulation of metals, particularly cadmium, copper, and zinc, appears to be highest near and in Terrace Reservoir, and may adversely affect fish survival and growth.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are remedial goals of the site-wide remedy that address migration, exposure pathways, and potential receptors of contamination from the site. The RAOs for the site-wide final remedy are presented below.

1. Control and treat surface water, ground water and leachate, as necessary, to meet State and Federal ***applicable or relevant and appropriate requirements*** (ARARs).
2. Re-establish State aquatic use classification and attainment of water quality numeric criteria in Segment 3c of the Alamosa River and downstream.
3. Ensure geotechnical stability of constructed earthen structures and slopes.
4. Mitigate erosion and transport of sediment into Wightman Fork and Cropsy Creek.
5. Control airborne contaminants from the site.

The lead agency has determined that the preferred alternative identified in this Proposed Plan has the highest probability of meeting the RAOs, is protective of public health and welfare, and protects the environment from actual or threatened releases of hazardous substances.

SUMMARY OF REMEDIAL ALTERNATIVES

The initial step in developing alternatives for the final site-wide remedy was preparation of a ***Feasibility Study Technical Memorandum***. The Technical Memorandum identified ***General Response Actions***, which are general categories of remedial technologies or process options, that can be used individually or in combination to satisfy the RAOs. The document identified 21 conceptual remedial alternatives for further evaluation.

An ***Engineering Alternatives Report*** was subsequently prepared to further evaluate and screen treatment technologies and combinations of remedial components. Each conceptual alternative was evaluated using the criteria of effectiveness, implementability and cost. Stakeholder input was also considered in the evaluation process. The Engineering Alternatives Report presented remedial alternatives that were carried forward for detailed analysis in the Feasibility Study. These alternatives are discussed below.

ALTERNATIVE 1A - No Action: In accordance with the NCP, a no-action response was retained for consideration to provide a baseline against which other technologies were compared. Implementation of the no-action alternative assumes that no other responses will be implemented following the completion of the interim remedial actions and that the remaining contaminated sources remain at the site with no plans for future control or removal. The only components of this alternative include site monitoring, maintenance and management.

Capital Costs	$0
Short-, Long-Term O&M; Periodic Costs	$9,696,000
Total 100-Year Present Value	$9,696,000
Time to Implement Remedial Action	< 1 year

ALTERNATIVE 1B - No Further Action/Summitville Dam Impoundment Breach: This alternative is similar to the no-action Alternative 1A, but includes limited construction to leave the site in a safe condition. Currently, the State Engineer requires that the embankment of the Summitville Dam Impoundment be upgraded. Because this alternative does not include water treatment or upgrade of the impoundment embankment, the State Engineer would require the embankment to be breached from a safety perspective. This would prevent a possible catastrophic failure of the embankment and release of a large volume of contaminated water. The major components include: 1) breach of the Summitville Dam Impoundment embankment; 2) minimal rehabilitation of the Reynolds and Chandler Adits; and 3) demolition of site buildings.

Capital Costs	$3,426,000
Short-, Long-Term O&M; Periodic Costs	$13,211,000
Total 100-Year Present Value	$16,637,000
Time to Implement Remedial Action	< 1 year

ALTERNATIVE 2 - Clean Water Diversion/New Dam Below Confluence of Wightman Fork and Cropsy Creek/Passive Water Treatment: Alternative 2 contains no active water treatment and relies upon a large impoundment (2,503 acre-feet) to passively treat AMD from the site. This alternative was retained for consideration because it was the only passive treatment technology that could potentially treat the large volume of contaminated water from the site, even though this technology is unproven at mine sites at this large scale and altitude. The new dam for the impoundment would be constructed below the confluence of Cropsy Creek and Wightman Fork. The success of Operable Unit 4 reclamation is not critical to this alternative. The major components include: 1) construction of a new impoundment; 2) breach of the existing Summitville Dam Impoundment embankment; 3) construction of Wightman Fork and Cropsy Creek clean water diversions; 4) rehabilitation of the Reynolds and Chandler Adits; and 5) demolition of site buildings.

Capital Costs	$23,158,000
Short-, Long-Term O&M; Periodic Costs	$12,376,000
Total 100-Year Present Value	$35,534,000
Time to Implement Remedial Action	2 to 3 years

ALTERNATIVE 3 - Upgrade Summitville Dam Impoundment/Existing Water Treatment Facility with Seasonal Treatment: This alternative represents *status quo* operations at the site. It considers the long-term operation of

the existing treatment plant and pumpback system, Summitville Dam Impoundment and ditch system. The Summitville Dam Impoundment would be minimally upgraded and would maintain its current storage capacity (275 acre-feet). The Summitville Dam Impoundment would receive water as currently designed from certain hydrologic basins (total of 376 acres), excluding the Cropsy Creek basin. Water treatment would be seasonal (i.e., May through October). The major components include: 1) minimal upgrade of the existing Summitville Dam Impoundment dam; and 2) minimal upgrade of Wightman Fork Diversion to contain the 100-year storm event.

Capital Costs	$1,577,000
Short-, Long-Term O&M; Periodic Costs	$83,846,000
Total 100-Year Present Value	$85,423,000
Time to Implement Remedial Action	< 1 year

ALTERNATIVE 4 - Upgrade Summitville Dam Impoundment/New On-site Water Treatment Plant with Flexible Treatment Season: Alternative 4 considers construction of a new Water Treatment Plant closer to the Summitville Dam Impoundment and construction of a new influent delivery system (wet well). The water treatment system would have a flexible treatment season. The Summitville Dam Impoundment would be upgraded, but rerouting of on-site surface water would allow the storage of the ***design event*** (500-year thunderstorm and 100-year snow melt), without increasing its capacity of 275 acre-feet. The upgrade of site ditches would reduce the hydrologic basins tributary to the Summitville Dam Impoundment to only the ***highwall*** and the Beaver Mud Dump/Summitville Dam Impoundment basins (68 acres). Reclamation is assumed to be 100 percent effective in the remaining disturbed area of the site (504 acres). The major components include: 1) upgrade of the existing Summitville Dam Impoundment; 2) construction of a Water Treatment Plant and influent delivery system; 3) upgrade of Wightman Fork Diversion; 4) upgrade of select ditches and construction of a new highwall ditch; 5) construction of ground water interceptor drains; 6) rehabilitation of Reynolds and Chandler Adits; and 7) demolition of site buildings.

Capital Costs	$17,364,000
Short-, Long-Term O&M; Periodic Costs	$55,575,000
Total 100-Year Present Value	$72,939,000
Time to Implement Remedial Action	2 years

ALTERNATIVE 5 - New Dam Upstream of Wightman Fork-Cropsy Creek Confluence/New Gravity-Fed Water Treatment Plant with Flexible Treatment Season: Alternative 5 considers construction of a new, larger impoundment (405 acre-feet) to ensure that releases of untreated water are less likely to occur in the future. Some degree of reclamation ineffectiveness (at least 5 percent) is expected and the larger impoundment could store the additional contaminated drainage. The dam would be located just upstream of the Cropsy Creek/Wightman Fork confluence, and the impoundment would store water from the design event from the highwall and the Beaver Mud Dump/Summitville Dam Impoundment basins (68 acres). A new Water Treatment Plant would be constructed downstream of the new dam that would use a gravity-fed influent delivery system. The Water Treatment Plant would have a flexible treatment season. The major components include: 1) construction of a new dam; 2) breach of the existing Summitville Dam Impoundment embankment; 3) construction of a conventional, gravity-fed Water Treatment Plant; 4) upgrade of Wightman Fork Diversion; 5) upgrade of select ditches and construction of a new highwall ditch; 6) construction of ground water interceptor drains; 7) rehabilitation of Reynolds and Chandler Adits; and 8) demolition of site buildings.

Capital Costs	$24,150,000
Short-, Long-Term O&M; Periodic Costs	$51,259,000
Total 100-Year Present Value	$75,409,000
Time to Implement Remedial Action	2 years

COMPARISON CRITERIA

Remedial alternatives were evaluated to identify the advantages and disadvantages of each alternative relative to one another using established criteria identified in the NCP. A description of each criterion is provided below.

1. Overall protection of human health and the environment addresses whether or not a remedial alternative can adequately protect human health and the environment from unacceptable risks posed by contaminants at the site.

2. Compliance with ARARs refers to whether or not a remedial alternative can attain Federal or State environmental laws and standards.

3. Long-term effectiveness and permanence refers to the ability of a remedial alternative to prove successful and effective over time.

4. Reduction of toxicity, mobility, or volume through treatment is the degree to which an alternative reduces health risks, movement and quantity of site pollutants and contaminants.

5. Short-term effectiveness evaluates the potential impacts to human health and the environment during implementation (construction) of remedial actions.

6. Implementability is a measure of the ease or difficulty of implementing a remedial alternative, and includes technical feasibility, administrative feasibility and availability of services and materials.

7. Cost is used to compare remedial alternatives differentiating between capital costs, and operation and maintenance costs; costs are presented as ***net present value.***

8. State acceptance refers to the State's position or concerns regarding the preferred alternative.

9. Community acceptance determines which component(s) of the alternatives interested persons in the community support, have reservations about, or oppose.

COMPARISON OF REMEDIAL ALTERNATIVES

Remedial alternatives were compared using the NCP criteria. A summary of the comparison is presented in Table 1. Predictions from a reactive transport model of Wightman Fork and Alamosa River were additionally used to assess compliance with ARARs; long-term effectiveness and permanence; and reduction of toxicity, mobility or volume through treatment. State acceptance was not used in the comparison, as this criterion applies to sites where EPA is the lead agency. Community acceptance will be determined when comments on this Proposed Plan are received.

At the time the human health assessment was conducted, impoundment and treatment of contaminated water at the site had already begun. This interim remedial action proved to be protective of human health. Therefore, the combination of an impoundment and active water treatment (Alternatives 3, 4, and 5) would be protective of human health. The level of protection of human health in Alternative 2 has not been evaluated, but is expected to be less than Alternatives 3, 4, and 5. Alternatives 1A and 1B would be even less protective of human health because water treatment is not employed.

With respect to protection of the environment, Alternative 5 offers additional impoundment capacity and the greatest level of protection of all alternatives. Additional storage capacity in Alternative 5 further reduces the possibility of untreated water being released from the site, and offers the ability to store and treat water from additional portions of the site, where reclamation is not entirely successful in reducing AMD. The reliability of the Water Treatment Plant influent delivery system in Alternative 5 is higher than that of Alternatives 3 and 4. Alternatives 1A and 1B would not be protective of the environment.

Alternative 5 has the greatest probability of achieving water quality ARARs in Alamosa River Segment 3c, which is the offsite point of compliance. Model predictions suggest that Alternatives 4 and 5 could achieve water quality standards in Alamosa River Segment 3c and in segments further downstream. Alternative 4 would have less probability of meeting water quality ARARs because it cannot store additional drainage from reclaimed areas that continue to produce AMD during the design event. Alternative 3 would continue to release untreated water to Wightman Fork during normal or above snow pack, which would have adverse effects on the downstream ecosystem. The ability of Alternative 2 to comply with water quality ARARs is unproven, because use of a large-capacity impoundment to passively treat AMD from the site has not been demonstrated. Alternatives 1A and 1B would not comply with water quality ARARs. None of the alternatives is expected to meet water quality ARARs in Alamosa River Segment 3b due to background conditions. ***Waiver*** of certain water quality standards would be required for each alternative.

The new impoundment and Water Treatment Plant in Alternative 5 provides more controls for management of contaminants from the site and is the most reliable of the alternatives on a long-term basis. Predictive modeling indicates that Alternative 5 consistently provided the lowest metals concentration and highest pH of water exiting the site. Alternative 4 is also capable of controlling site contaminants; however, without increasing the storage capacity of the Summitville Dam Impoundment, additional AMD from the site could not be stored. Alternative 3 is essentially the *status quo*, which has proven to be unreliable, resulting in releases of untreated water. The long-term effectiveness of Alternative 2 is unproven due to its reliance on large-capacity passive treatment that has not been successfully proven at mining sites. Alternatives 1A and 1B would have the lowest long-term effectiveness.

Alternatives 3, 4 and 5 incorporate similar water treatment technologies; thus, their ability to reduce the toxicity of site contaminants is similar. Alternative 5 is considered to have the highest reduction of contaminant mobility and volume because it would be able to store and treat additional AMD from areas of the site where reclamation has been unsuccessful. Alternative 4 would be less able to control releases of untreated water, and Alternative 3 would be even lower due to frequent releases of untreated water. The impoundment in Alternative 2 could potentially store the largest volume of AMD from the site, but it was considered to be less reliable than Alternatives 3, 4 and 5 at reducing toxicity, mobility or volume of contaminants because it relies on an unproven passive treatment technology. Alternatives 1A and 1B would achieve minimal reductions. These comparisons are supported by model-predicted reductions in copper concentrations at the downstream boundary of the site (Table 1).

Alternatives 2, 3, 4 and 5 would maintain the current short-term effectiveness of the existing Summitville Dam Impoundment/Water Treatment Plant system, as this system would not be taken off line until construction of the preferred alternative is complete. During implementation of each alternative, construction activities along Wightman Fork could degrade water quality on a short-term basis. Taking this into account, Alternative 3 would have the highest short-term effectiveness because disturbances within Wightman Fork would be minimal. However, releases from the Summitville Dam Impoundment in Alternative 3 could occur and would lower its

TABLE 1 - COMPARISON OF REMEDIAL ALTERNATIVES FOR SUMMITVILLE MINE SUPERFUND SITE

ia	Alternatives				
	1A- No Action and 1B - No Further Action/ Breach Summitville Dam Impoundment	**2 - Clean Water Diversion/New Dam Below Confluence/Passive Water Treatment**	**3 - Upgrade Summitville Dam Impoundment/Existing Water Treatment Facility with Seasonal Treatment**	**4 - Upgrade Summitville Dam Impoundment/New On-Site Water Treatment Plant with Flexible Treatment Season**	**5 - New Dam Upstream of Confluence/New Gravity-Fed Water Treatment Plant with Flexible Treatment Season**
lth	Not protective of human health and the environment because significant AMD would continue.	Possibly protective of human health, but not protective of the environment because passive treatment has not proven to be effective.	Protective of human health, but not protective of the environment because significant AMD would continue	Protective of human health and the environment because most all AMD would be contained and treated.	Highest protection of human health and the environment because most all AMD would be contained and treated.
	Does not comply with water quality ARARs; waiver of water quality standards would be required.	Compliance with water quality ARARs is unproven; waiver of water quality standards would be required.	Does not comply with water quality ARARs; waiver of water quality standards would be required.	High probability of complying with water quality ARARs; waiver of water quality standards would be required.	Highest probability of complying with ARARs; waiver of water quality standards would be required.
and	Minimal long-term effectiveness; point and non-point sources would continue to discharge AMD.	Unproven due to undemonstrated reliability of passive water treatment.	Low effectiveness due to frequent releases of untreated water during years of normal to above normal precipitation; problematic water treatment.	Moderate to high effectiveness, but unable to store and treat additional AMD.	Highest because it is able to store and treat additional AMD; gravity-fed delivery system has high reliability.
bility	Minimal reduction in mobility and volume, no reduction in toxicity.	Moderate to low reduction; 32 to 34 percent reduction in copper compared to Alternative 1B.	Moderate reductions, but frequent releases of untreated water could occur; 60 to 90 percent reduction in copper compared to Alternative 1B.	High because new Water Treatment Plant reduces volume of sludge produced, but unable to store and treat additional drainage; 86 to 97 percent reduction in copper compared to Alternative 1B.	Highest because new Water Treatment Plant reduces volume of sludge produced; able to store and treat additional drainage; 88 to 97 percent reduction in copper compared to Alternative 1B.
	Least effective because contaminated sediments and AMD would immediately impact Wightman Fork.	Low effectiveness due to considerable disturbance within Wightman Fork during construction of new dam.	Moderate to high effectiveness because disturbances in Wightman Fork minimal, but releases of untreated water would significantly lower the effectiveness.	Moderate to high effectiveness because remedial action would cause minimal disturbances. Disturbances would be less than Alternative 5.	Moderate effectiveness because some disturbances within Wightman Fork would occur during construction of new dam.
	Could be readily implemented.	Least implementable due to construction of large dam and purchase of substantial water rights.	Easiest to implement because current site operations are continued with little additional work.	Moderately implementable.	Moderately implementable, requiring a greater level of effort due to the new dam.
	Lowest total present value. ***1A - $9,696,000*** ***1B - $16,637,000***	Lowest O&M costs ***$35,534,000***	Highest total present value and highest O&M costs ***$85,432,000***	Second highest O&M costs ***$72,939,000***	Highest Capital Costs ***$75,409,000***

TABLE 1 - COMPARISON OF REMEDIAL ALTERNATIVES FOR SUMMITVILLE MINE SUPERFUND SITE					
Comparison Criteria	**Alternatives**				
	1A- No Action and 1B - No Further Action/ Breach Summitville Dam Impoundment	**2 - Clean Water Diversion/New Dam Below Confluence/Passive Water Treatment**	**3- Upgrade Summitville Dam Impoundment/Existing Water Treatment Facility with Seasonal Treatment**	**4- Upgrade Summitville Dam Impoundment/New On-Site Water Treatment Plant with Flexible Treatment Season**	**5 - New Dam Upstream of Confluence/New Gravity-Fed Water Treatment Plant with Flexible Treatment Season**
Protection of Human Health and the Environment	Not protective of human health and the environment because significant AMD would continue.	Possibly protective of human health, but not protective of the environment because passive treatment has not proven to be effective.	Protective of human health, but not protective of the environment because significant AMD would continue	Protective of human health and the environment because most all AMD would be contained and treated.	Highest protection of human health and the environment because most all AMD would be contained and treated.
Compliance with ARARs	Does not comply with water quality ARARs; waiver of water quality standards would be required.	Compliance with water quality ARARs is unproven; waiver of water quality standards would be required.	Does not comply with water quality ARARs; waiver of water quality standards would be required.	High probability of complying with water quality ARARs; waiver of water quality standards would be required.	Highest probability of complying with ARARs; waiver of water quality standards would be required.
Long-Term Effectiveness and Permanence	Minimal long-term effectiveness; point and non-point sources would continue to discharge AMD.	Unproven due to undemonstrated reliability of passive water treatment.	Low effectiveness due to frequent releases of untreated water during years of normal to above normal precipitation; problematic water treatment.	Moderate to high effectiveness, but unable to store and treat additional AMD.	Highest because it is able to store and treat additional AMD; gravity-fed delivery system has high reliability.
Reduction of Toxicity, Mobility or Volume	Minimal reduction in mobility and volume, no reduction in toxicity.	Moderate to low reduction; 32 to 34 percent reduction in copper compared to Alternative 1B.	Moderate reductions, but frequent releases of untreated water could occur; 60 to 90 percent reduction in copper compared to Alternative 1B.	High because new Water Treatment Plant reduces volume of sludge produced, but unable to store and treat additional drainage; 86 to 97 percent reduction in copper compared to Alternative 1B.	Highest because new Water Treatment Plant reduces volume of sludge produced; able to store and treat additional drainage; 88 to 97 percent reduction in copper compared to Alternative 1B.
Short-Term Effectiveness	Least effective because contaminated sediments and AMD would immediately impact Wightman Fork.	Low effectiveness due to considerable disturbance within Wightman Fork during construction of new dam.	Moderate to high effectiveness because disturbances in Wightman Fork minimal, but releases of untreated water would significantly lower the effectiveness.	Moderate to high effectiveness because remedial action would cause minimal disturbances. Disturbances would be less than Alternative 5.	Moderate effectiveness because some disturbances within Wightman Fork would occur during construction of new dam.
Implementability	Could be readily implemented.	Least implementable due to construction of large dam and purchase of substantial water rights.	Easiest to implement because current site operations are continued with little additional work.	Moderately implementable.	Moderately implementable, requiring a greater level of effort due to the new dam.
Cost ***Total Present Value:***	Lowest total present value. ***1A - $9,696,000*** ***1B - $16,637,000***	Lowest O&M costs ***$35,534,000***	Highest total present value and highest O&M costs ***$85,432,000***	Second highest O&M costs ***$72,939,000***	Highest Capital Costs ***$75,409,000***

short-term effectiveness. Alternative 4 would have a slightly lower short-term effectiveness because construction of a new Water Treatment Plant could potentially introduce contaminants to Wightman Fork. Alternative 5 would have a slightly lower short-term effectiveness because contaminants could be released during construction of a new dam within the Wightman Fork channel. Alternative 2 would have an even lower short-term effectiveness because the dam is considerably larger and the disturbance would cause an even greater amount of contaminants to be released during construction. Alternatives 1A and 1B would have the lowest short-term effectiveness, as AMD and contaminated sediments from the Summitville Dam Impoundment would immediately enter Wigthman Fork.

Alternative 1A would be the easiest to implement because no new remedial actions are proposed. Alternative 3 would be the next easiest to implement because it is a continuation of current site operations. Alternative 1B could also be readily implemented and would not pose technical or administrative difficulties. Alternatives 4 and 5 would require a greater level of effort and the implementability of these alternatives is considered to be medium. Alternative 2 would be the most difficult to implement because of the large quantity of materials required to construct the dam and water rights that would have to be purchased to fill the impoundment.

Total costs for the final remedy would occur over two phases: 1) Remedial Action, and 2) long-term operation and maintenance (O&M). The Remedial Action phase includes the ***Remedial Design,*** remedy construction, and a period of up to 10 years of O&M until the remedy is considered complete. Following the Remedial Action phase, the long-term O&M would begin and the financial responsibility is shifted from the Federal government to the State. A 100-year period of analysis (project life) and a 4.2 percent discount factor were used.

Alternative 1A has the lowest total cost (present value), followed closely by Alternative 1B (Table 1). Alternative 2 has the next lowest total cost. Although capital costs for Alternative 2 are relatively high (second highest), the O&M costs are the lowest because active water treatment is not employed. The total cost for Alternative 4 is about double the cost of Alternative 2, and Alternative 5 is slightly higher than Alternative 4 due to construction of a new impoundment. Alternative 3 has the highest total cost and highest O&M cost, which is due continued use of the existing Water Treatment Plant and influent delivery system.

PREFERRED ALTERNATIVE

The goal of the Summitville Mine final site-wide remedy is to capture AMD, contain it in an on-site impoundment, and treat water to remove metals to achieve water quality standards in the Alamosa River. The final remedy continues the benefits achieved through the four Interim Records of Decision and further reduces and controls the AMD exiting the site.

In the evaluation of alternatives, the CDPHE and EPA have determined that little distinction exists between Alternatives 4 and 5. Both alternatives involve modifications to on-site ditches, upgrade of the Wightman Fork Diversion, adit rehabilitation, management of runoff from the highwall, relocation of the U.S. Forest Service access road, building demolition, site monitoring and maintenance. The differences between the alternatives are the location of a new Water Treatment Plant and the storage capacity of an on-site impoundment for contaminated water. The location of the Water Treatment Plant depends upon obtaining land at the appropriate location. The size of the impoundment depends upon the degree of success of the already implemented interim actions, and the margin of safety to prevent untreated releases.

Alternatives 4 and 5 evaluated against each of the seven criteria (shown in Table 1) illustrates that they are nearly identical. For these reasons, the agencies believe that Alternatives 4 and 5 are not significantly different and can be blended into a single alternative; heretofore, called the "preferred alternative." The agencies remain committed to the RAOs, previously stated as the basis for remedy selection. The components of the preferred alternative primarily consist of: 1) a dam and impoundment upstream of the Wightman Fork-Cropsy Creek confluence, and 2) a new gravity-fed Water Treatment Plant located downstream of the impoundment. The decision regarding the size of the storage impoundment is deferred as a remedial design decision pending the demonstrated performance of the site-wide reclamation (Operable Unit 4). Reclamation will be complete by the end of the 2001 field season. Because it can take a few years for reclamation to mature, data will be collected to assess the effectiveness of reclamation. The impoundment storage capacity will be based on the projected volume of runoff from the site that must be contained to meet RAO Nos. 1, 2 and 3 and to minimize or eliminate untreated releases.

The preferred alternative will be protective of human health and the environment, have the highest compliance with ARARs and achievement of RAOs among remedial alternatives, reduce contaminant volume and mobility, and have long-term effectiveness. The short-term effectiveness and implementability are considered to be moderate. The following summarizes the benefits and rationale for selection of the preferred alternative.

- Releases of untreated water from the site will be significantly reduced, if not eliminated.
- Minimizes risks to downstream ecological receptors.
- Includes a new Water Treatment Plant that employs a proven and effective water treatment technology.
- Uses a more reliable influent delivery system that requires low O&M.

- Location of the Water Treatment Plant and gravity-fed delivery system allows for a flexible treatment season (i.e., year-round if needed).
- Attains the highest level of protection of human health and the environment in the most cost effective manner.

The preferred alternative is the most ARAR compliant of the alternatives that were evaluated although some ARARs will be waived. Designated use classifications and water quality standards for the Alamosa River Segment 3c and downstream will be met. All other ARARs not specifically identified for a waiver will also be met.

WAIVER OF ARARs

The selection of the preferred alternative will require a waiver of some State of Colorado surface water standards (CDPHE, WQCC, Regulation 36, Classifications and Numeric Standards for Rio Grande Basin). It is proposed that numeric standards for pH, aluminum, and iron, and the aquatic life use classification for Alamosa River Segment 3b (mouth of Wightman Fork to Town of Jasper) be waived. The justification for waiving these standards is the analysis performed in the ***Use Attainability Assessment***, which demonstrated that the currently assigned numeric standards for this segment are unattainable under any baseline condition due to the presence of naturally occurring mineralized terrains that contribute metals and acidity to the Alamosa River. Therefore, remediation of the Summitville Mine site will be incapable of achieving these standards. Waiver of the agricultural use classification for Segment 6 (Wightman Fork) is also proposed primarily because of the inability of the final remedy to meet manganese agricultural standards. Technical impracticability is the statutory basis for waivers in Segments 3b and 6. No waivers are proposed for the remaining mainstem Alamosa River Segments 3c, 8, 9 and 10. A discussion of waivers is contained in Appendix E of the Feasibility Study report.

MONITORING OF EFFECTIVENESS

Any final remedy, and specifically this preferred alternative, will require monitoring to evaluate current and future site status, remedy performance and compliance with ARARs. Monitoring is an integral part of determining if the remedy is successful. CERCLA 300.430 (f)(4)(ii) requires that if a remedial action is selected that results in contaminants remaining on site, a review of the final remedy shall occur at intervals of no less than five years. At the five-year review the agencies determine, through the use of monitoring data, whether the remedy is and will continue to be successful. At this time, the agencies may suggest modifications to the remedy to insure continued compliance with ARARs.

To this end, the agencies are currently putting in place a detailed monitoring plan to evaluate the performance of the interim actions and will be conducting, for the purposes of developing a final remedy design, investigatory drilling to ascertain the best location for large engineered structures such as the Water Treatment Plant and the impoundment. The on-site and offsite data collected during the years 2001 and 2002, as well as historical data, will be used to size water conveyance and storage structures. Included in this monitoring is continued sampling of the Alamosa River water and sediments to assess downstream effects of remedial actions conducted at the site. There are specific regulations, standards and designated uses for water of the Alamosa River and Terrace Reservoir. However, there are no such regulations, standards or designated uses for sediments of the river and reservoir. The potential impact of sediments on the environment is measured by its affect on the water and the ability to sustain aquatic life. With the existing monitoring data and computer models, the agencies believe that meeting water quality standards in Alamosa River Segment 3c and downstream is achievable with the preferred alternative. Thus at this time, sediment remediation is not planned for either the Alamosa River nor Terrace Reservoir. The monitoring program will continue to assess the attainment of stream standards and the return of aquatic life to the river and reservoir. The five-year review will, in particular, consider the disposition of stream and reservoir sediment in as much as it prevents attainment of the stated **Remedial Action Objectives**. The agencies believe this is a reasonable approach given that Operable Unit 4 reclamation will be completed this year and must be allowed time to mature. In addition, the preferred alternative collects the majority of the contaminated water generated at the site and prevents or eliminates untreated releases. Thus, significant improvement in the downstream aquatic environment is expected as a result of these actions.

ACRONYMS

AMD Acid mine drainage
ARARs Applicable or Relevant and Appropriate Requirements
CDPHE Colorado Department of Public Health and Environment
EPA United States Environmental Protection Agency
NCP National Oil and Hazardous Substance Pollution Contingency Plan
O&M Operations and Maintenance
RAOs Remedial Action Objectives
WQCC Water Quality Control Commission

GLOSSARY

Acid Mine Drainage - mining disturbances that result in surface water or ground water having a low (acidic) pH generally less than 4 standard units and elevated dissolved metals concentrations.

Administrative Record - The body of documents associated with characterization and remedy selection at a site.

Applicable or Relevant and Appropriate Requirements - Federal and State requirements for cleanup, control and environmental protection that a remedial action will meet.

Aquatic biota - Organisms living in surface water including fish, macroinvertebrates, and zooplankton.

Baseline Human Health Risk Assessment - A study that determines and evaluates risk that site contamination poses to human health.

Capital costs - Expenditures initially incurred to build or install the remedial action.

Design Event - Used to size impoundment storage and diversion ditches, taking into account precipitation and snow melt runoff; includes the 100-year snow melt (over 60 days) and 500-year thunderstorm (over 24 hours).

Ecological Risk Assessment - Study that assesses risks to aquatic, terrestrial and agricultural receptors posed by contaminant releases from a site.

Engineering Alternatives Report - Supplemental document that evaluates conceptual remedial alternatives on an engineering basis, resulting in a selection of preferred alternatives for detailed evaluation in the Feasibility Study.

Feasibility Study - Identifies and evaluates the appropriate technical approaches and treatment technologies to address contamination at a site.

Feasibility Study Technical Memorandum - Initial document that assembles and preliminarily evaluates possible alternatives for the final site-wide remedy.

General Response Actions - General categories comprised of remedial technologies, or process options, that are taken individually or in combination to satisfy the remediation goals.

Highwall - The unexcavated face of exposed rock resulting from open-pit mining.

Interim Record of Decision - Document that specifies a response action to be implemented prior to final remedy selection.

Metals loading - Mass of metals in surface water or groundwater; typically measured in pounds per day.

National Oil and Hazardous Substance Pollution Contingency Plan - Regulations governing cleanups under EPA's Superfund program.

National Priorities List - EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for cleanup under the Superfund program.

Net present value - Current cost to construct and operate a response action over the project life, subject to a specified discount rate.

Operable Unit - A distinct portion or action at Superfund site.

Periodic costs - Costs that occur only once every few years during the O&M period; may be either capital or O&M costs.

Preferred alternative - Final remedial alternative that meets NCP evaluation criteria and is supported by regulatory agencies.

Proposed Plan - A notification document requesting public input on a proposed remedial alternative.

Public Health Assessment - Assessment of risks posed to human health by releases of contaminants from a site.

Remedial Action - Action(s) taken to correct or remediate contamination.

Record of Decision - A document that is a consolidated source of information about a Superfund site, the remedy selection process, and the selected remedy.

Remdial Action Objectives - Remediation goals for protection of human health and the environment.

Remedial Design - Engineering design and evaluation phase prior to implementation of a Remedial Action.

Remedial Investigation - A study conducted to identify the types, amounts and locations of contamination at a site.

Short- and long-term O&M costs - Post-construction costs necessary to ensure or verify the continued effectiveness of a remedial action.

Use Attainability Assessment - A document prepared for the Water Quality Control Commission in support of recommended changes to the underlying numeric stream standards for the Alamosa River.

Waiver - A notice of intent to not commit to meeting a specific regulatory requirement, standard, etc.

MAIL CODE : 2900RP

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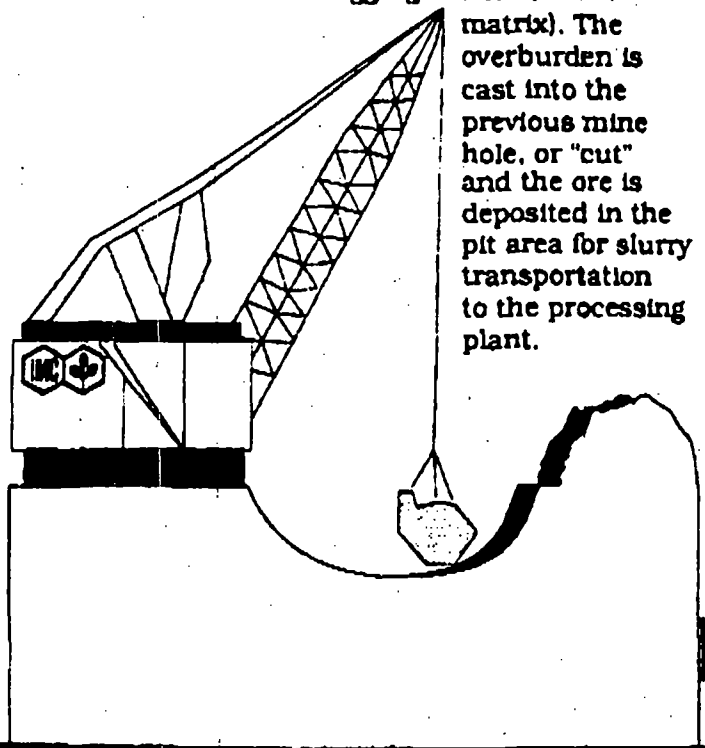
1 UNMINED LAND

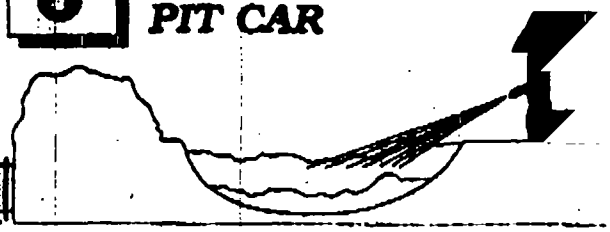
Phosphate deposits quite often occur under scrub range land, which generally has poor surface soil and low agricultural value. When it is ready to mine, the company must go through a rigorous permitting process, taking several years and costing millions. Even then, no mining may begin until a reclamation plan has been approved by various government agencies. This land is largely sand overburden averaging approximately 25'. Beneath is the average 25' of ore body consisting of approximately 1/3 sand, 1/3 clay and 1/3 phosphate (limestone strata is below the ore).

2 DRAGLINE

The huge excavating machine performs two jobs: removing the soil that covers the ore (called overburden) and then digging the ore (called matrix). The overburden is cast into the previous mine hole, or "cut" and the ore is deposited in the pit area for slurry transportation to the processing plant.



3 PIT CAR



The dragline deposits the matrix in a shallo containment area called a well, where high pressure water guns, controlled from the portable pit car, liquify it into a watery mixture, called slurry. The matrix averages 1/3 sand, 1/3 clay, 1/3 phosphate and is slurry pumped by pipeline to a processing plant where the phosphate is separated from the sand and the clay.

4 WASHER

The first stage of processing the ore involv washing, crushing, log washers and vibra screening. The clay becomes suspended i water and is sent via pipeline slurry to a c settling pond . Staying on top of the scree is +16 mesh phosphate rock pebble. A fini product which is sent to dewatering tanks and then to the inventory pile. Through th screening goes the combination sand and phosphate for flotation processing.

5 CLAY STORAGE

The clay that has been separated from the c to diked ponds and slowly settles to the bott ponds have an abundance of wildlife and al reservoirs that enable us to recycle more tha water we require for mining and processing. ponds are reclaimed, often to grazing pastu

6 FLOTATION PLANT

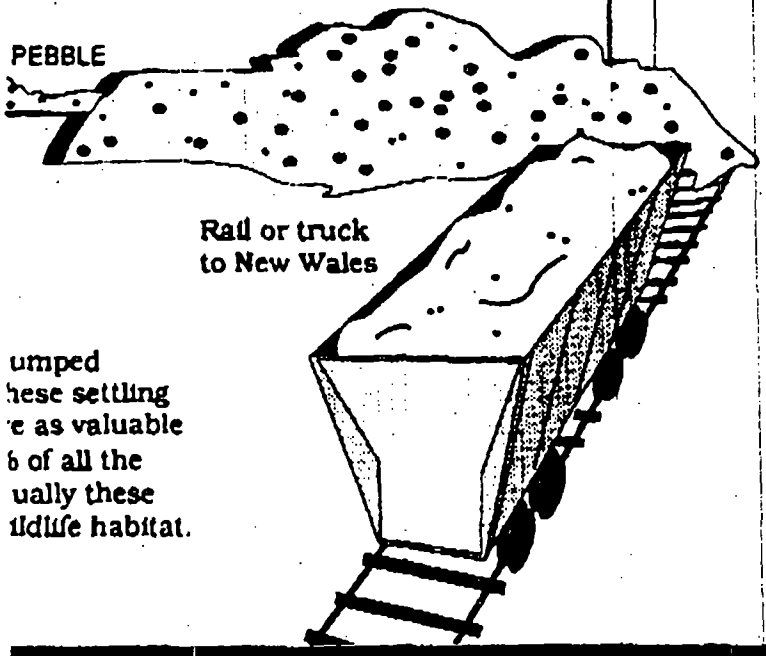
Mild chemical reagent additives are mixed with the feed to float separate the minute-sized phosphate particles from the sand. The sand, known as sand tailings, is then pumped to the mined-out areas for reclamation. The phosphate concentrate is sent to dewatering tanks and then to the inventory pile.

SAND AND PHOSPHATE CONCENTRATE

7 PHOSPHATE STORAGE PILE

The phosphate pebble from the washer and the phosphate concentrate from the flotation plant are stored in outdoor piles (10% water) for eventual use at IMCF New Wales for processing or sale to chemical companies for processing into fertilizer and animal feed ingredients. Drying is performed prior to all overseas shipments (10% to 2% water).

CONCENTRATE



umped
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8 SAND TAILINGS DISPOSITION

SAND

The sand, after it has been separated fro the phosphate at the flotation plant, is pumped back to the mined-out areas for in reclamation and construction of clay settling pond dikes.

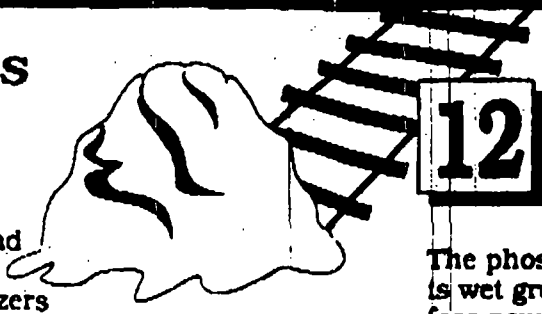
9 RECLAMATION

Land is returned to a variety of land forms, for multitude of uses. Strict reclamation regulatio which must be approved prior to mining, specif contours, drainage and vegetation. After earth moving and planting is complete, and the vegetation has been established, government officials inspect the area and certify the completion of reclamation. Reclaimed land is usually more productive than pre-mined land, because of fertilizing, seed and the improvemen of drainage and water-holding capacity of the s

10 IMCF PORT SUTTON

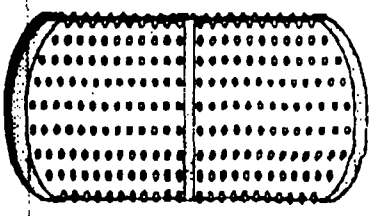
Shipping through our own terminal at Tampa Bay provides efficient service and dockside storage for customer shipments.

11 NEW WALES COMPLEX



Phosphate rock averaging 67 BPL, is transported from the mining area via truck and railcar for storage awaiting future processing into fertilizers and animal and poultry feed supplements.

12 GRINDING

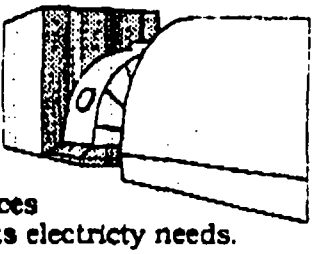


The phosphate rock is wet ground to face powder consistency using ball and rod mills.

14 MONSANTO SULFURIC PLANTS

Five plants convert the hot molten sulfur, 1,500,000 tons annually, to H_2SO_4 (sulfuric acid).

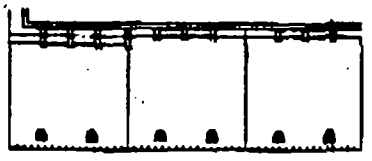
15 ELECTRICTY COGENERATION



During the process of burning the molten sulfur and converting it into sulfuric acid, the steam is used to produce electricity through cogeneration.

New Wales produces up to 90% of all its electricty needs.

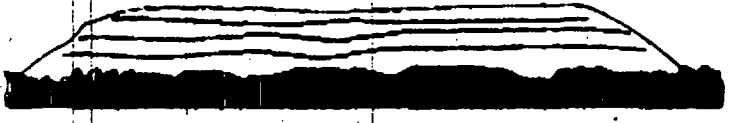
17 THREE PRAYON PHOSPHORIC ACID PLANTS



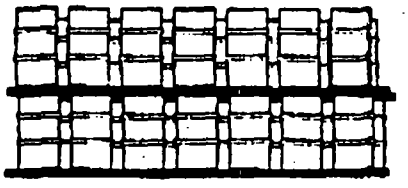
The sulfuric acid and wet ground phosphate rock is combined in the three attack tanks whereby the chemical reaction takes place producing phosphoric acid and gypsum. Filtering also takes place, separating the P_2O_5 (phosphoric acid) from the gypsum prior to it being pumped to the gypsum storage area.

18 GYPSUM PILE

Approximately 23,000 tons per day of byproduct gypsum is produced and is slurried to the pile.



20 URANIUM RECOVERY



The carbon filtered clean 27% acid is processed through the uranium operation and U_3O_8 yellow cake uranium is recovered at a rate of approximately one pound per ton of 100% P_2O_5 phosphoric acid.

21 P_2O_5 TO CONCENTRATION

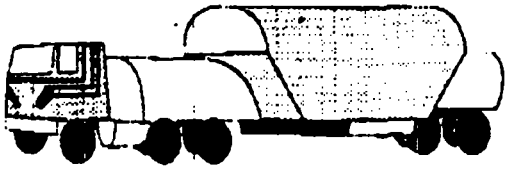
The 27% phosphoric acid comes from uranium and is evaporated to 40% and 54% acid for processing into fertilizers and animal feed supplements.

22 FERTILIZER

Three plants	DAP	18 - 46 - 0
One plant	MAP	10 - 50 - 0
One plant	GTSP	0 - 46 - 0

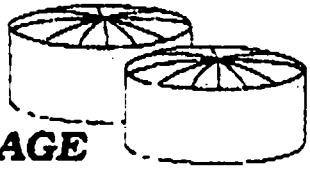
23 ANIMAL AND POULTRY FEED SUPPLEMENTS

Two plants process phosphoric acid into defluorinated animal and poultry feed supplements.



13 MOLTEN SULFUR

Specially designed trucks transport hot molten sulfur from Tampa to the New Wales complex. The molten sulfur is in the tube portion of the truck. The saddle portion of the truck is filled with dry fertilizer and returns to Tampa for shipment through our IMCF Port Sutton terminal. Some sulfur comes to New Wales via rail from Canada.



16 SULFURIC ACID STORAGE

Storage tanks hold the inventory awaiting further processing with ground phosphate rock. 4,600,000 tons being processed annually.

19 P_2O_5 PHOSPHORIC ACID

The 27% P_2O_5 phosphoric acid is sent for carbon cleanup prior to uranium extraction processing.

FACTS AND FIGURES

Employment	
Employment IMC Fertilizer, Inc. Florida	3,000
Employment Direct Phosphate Industry	10,000
Employment Indirect Phosphate Industry	50,000
Taxes Industry	
Sales	$22,116,477
Corporate Income Tax	24,090
Vehicle Fuel Tax	272,227
Severance Tax Annual 1988	51,177,100
Severance Tax Since 1971	725,749,627
Ad Valorem to Counties (property)	25,392,266
IMCF Phosphate Rock Production Capacity Tons	22,000,000
IMCF Phosphoric Acid Production Capacity Tons	1,700,000
IMC Animal and Poultry Feed Capacity Tons	600,000
IMCF U_3O_8 Yellow Cake Uranium Capacity Pounds	2,200,000

7/29/89

Welcome to

FERTILIZER, INC.

Florida Operations

The geology of Florida phosphate is an interesting story. The largest phosphate deposits are found in the Bone Valley in Central Florida. These deposits formed 10 to 15 million years ago during the late Miocene or Pliocene Age. The Hamilton County deposit in North Florida is associated with the Hawthorn Formation of Miocene Age.

Phosphorus is present in the waters of the oceans which covered what is now Florida. As the water receded or evaporated, the phosphate was left. Some of Florida's phosphate also is derived from the remains of prehistoric marine animals, such as sharks and manatees. In fact, fossilized parts of these animals are found as we mine.

We hope you enjoy your visit and tour of our Florida Operations. Come see us again soon.

CHAPTER 62-673 PHOSPHOGYPSUM MANAGEMENT

62-673.200 Definitions.

The following words, phrases or terms as used in this chapter, unless the context indicates otherwise, shall have the following meaning:

(1) "Aquifer" means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells, springs or surface water.

(2) "Closing" means the time at which a phosphogypsum stack system ceases to accept wastes, and includes those actions taken by the owner or operator of the facility to prepare the system for any necessary monitoring and maintenance after closing.

(3) "Closure" means the cessation of operation of a phosphogypsum stack system and the act of securing such a system so that it will pose no significant threat to human health or the environment. This includes closing, long-term monitoring, maintenance and financial responsibility.

(4) "Department" means the State of Florida Department of Environmental Protection.

(5) "Disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste into or upon any land or water so that such solid waste or any constituent thereof may enter other lands or be emitted into the air or discharged into any waters, including groundwaters, or otherwise enter the environment.

(6) "Facility" means all contiguous land and structures, other appurtenances and improvements on the phosphate fertilizer manufacturing complex.

(7) "Final cover" means the materials used to cover the top and sides of a phosphogypsum stack upon closure.

(8) "Geomembrane" means a low-permeability synthetic membrane used as an integral part of a system designed to limit the movement of liquid or gas in the system.

(9) "Lateral expansion" means the expansion, horizontally, of phosphogypsum or process wastewater storage capacity beyond the permitted capacity and design dimensions of the phosphogypsum stack, or cooling ponds, surge ponds, and perimeter drainage conveyances at an existing facility. Any phosphogypsum stack, cooling pond, surge pond, or perimeter drainage conveyance which is constructed within 2000 feet of an existing phosphogypsum stack system, measured from the edge of the expansion nearest to the edge of the footprint of the existing phosphogypsum stack system, is considered a lateral expansion.

(10) "Leachate" means liquid that has passed through or emerged from phosphogypsum.

(11) "Liner" means a continuous layer of low permeability natural or synthetic materials which controls the downward and lateral escape of waste constituents or leachate from a phosphogypsum stack system.

(12) "100-year floodplain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

(13) "Phosphogypsum" means calcium sulfate and byproducts produced by the reaction of sulfuric acid with phosphate rock to produce phosphoric acid. Phosphogypsum is a solid waste within the definition of Section 403.703(13), F.S.

(14) "Phosphogypsum stack" means any defined geographic area associated with a phosphoric acid production facility in which phosphogypsum is disposed of or stored, other than within a fully enclosed building, container or tank.

(15) "Phosphogypsum stack system" means the phosphogypsum stack (or pile, or landfill), together with all pumps, piping, ditches, drainage conveyances, water control structures, collection pools, cooling ponds, surge ponds and any other collection or conveyance system associated with the transport of phosphogypsum from the plant to the phosphogypsum stack, its management at the stack, and the process wastewater return to the phosphoric acid production or other process. This definition specifically includes toe drain systems and ditches and other leachate collection systems, but does not include conveyances within the confines of the

fertilizer production plant or existing areas used in emergency circumstances caused by rainfall events of high volume or duration for the temporary storage of process wastewater to avoid discharges to surface waters of the state, which process wastewater shall be removed from the temporary storage area as expeditiously as possible not to exceed 120 days after each emergency.

(16) "Process wastewater" means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product, along with any leachate or runoff from the phosphogypsum stack system. This term does not include contaminated nonprocess wastewater as that term is defined in 40 CFR 418.11(c).

(17) "Shallow water supply well" means any potable water well which pumps water from an unconfined water table aquifer.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.703, 403.707 FS. History–New 3-25-93, Formerly 17-673.200.

62-673.220 Applicability.

(1) The provisions of this chapter apply to new phosphogypsum stack systems or lateral expansions of existing phosphogypsum stack systems for which a complete permit application or request for modification of an existing permit is submitted after 3-25-93.

(a) Except for incidental deposits of phosphogypsum entrained in the process wastewater, placement of phosphogypsum outside the phosphogypsum stack footprint is considered a lateral expansion of the phosphogypsum stack system. The footprint is defined as the outside edge of the starter dikes used to contain the placement of phosphogypsum in the stack.

(b) Storage or containment of process wastewater outside the footprint of the phosphogypsum stack, cooling ponds, surge ponds, or perimeter drainage conveyances existing on 3-25-93 is considered a lateral expansion of the phosphogypsum stack system. The footprint is defined as the outside edge of the dams, dikes or ditches used to store or contain process wastewater.

(2) Rule 62-673.500, F.A.C., shall also apply to existing active facilities after 3-25-93 at the time of permit renewal, or upon issuance of a temporary operating permit.

(3) Rules 62-673.600-.650, F.A.C., apply to all phosphogypsum stack systems, whether planned, active, or inactive as described in Rule 62-673.600(1), F.A.C.

(4) Lateral expansions of phosphogypsum stack systems are considered existing installations as defined in Chapter 62-522, F.A.C.

(5) Notwithstanding the provisions of paragraph (1)(a) of this section, placement of phosphogypsum into an existing process wastewater area located adjacent to and extending to no more than 350 feet from the edge of the footprint of an existing phosphogypsum stack is not considered a lateral expansion if:

(a) By [3-25-93 + 3 months], the owner or operator of the phosphogypsum stack system submits to the Department an application for a construction permit for the additional placement area which demonstrates that such placement will not result in a violation of applicable Department ground water standards or criteria;

(b) By [3-25-93 + 3 months], the owner or operator of the phosphogypsum stack system submits to the Department an application, which includes detailed design features, for a permit to construct a new lined cooling pond which meets the design requirements of Rule 62-673.400, F.A.C., and this cooling pond is constructed within two years of the issuance of the construction permit; and

(c) No phosphogypsum is placed in any unlined area after [3-25-93 + 8 years].

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.220.

62-673.300 Prohibitions.

(1) No person shall dispose of, or store prior to disposal, any phosphogypsum except within a phosphogypsum stack system permitted by the Department in accordance with this chapter. This provision shall not be construed to prohibit any use or reuse of phosphogypsum not otherwise prohibited by law.

(2) Material subject to the licensure requirements of Chapter 404, F.S., and Chapter 64E-5, F.A.C., shall only be placed on a phosphogypsum stack in accordance with the terms of that license issued by the Department of Health and Rehabilitative Services.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707, 403.708 FS. History–New 3-25-93, Formerly 17-673.300.

62-673.310 Alternate Procedures and Requirements.

(1) Any person subject to the provisions of this chapter may request in writing a determination by the Department that a procedure or requirement shall not apply, and shall request approval of alternate procedures or requirements.

(2) The request shall set forth at a minimum the following information:

(a) The specific facility or site for which an exception is sought;

(b) The specific procedures or requirements from which an exception is sought;

(c) The basis for the exception;

(d) The alternate procedure or requirement for which approval is sought and a demonstration that this alternate procedure or requirement provides an equal degree of protection for the public and the environment; and

(e) A demonstration of the effectiveness of the proposed alternative procedure or requirement.

(3) The department shall authorize by order each alternative procedure or requirement approved for an individual facility or site in accordance with this section or shall deny by order the request for such approval.

(4) Requests for alternate procedures or requirements shall be accompanied by a fee of $2000 in accordance with Rule 62-4.050(4)(m)4., F.A.C. Requests must be submitted to the Director of Water Facilities, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.310.

62-673.320 Permitting of Phosphogypsum Stack Systems.

(1) No phosphogypsum stack system shall be constructed, operated, expanded, modified or closed without an appropriate and currently valid permit issued by the Department in accordance with this chapter. Facilities operating without a permit on 3-25-93 shall, within 180 days, apply for a temporary operating permit from the Department.

(2) Permit application. The person making application for a permit for a phosphogypsum stack system shall submit to the respective Department district office having jurisdiction where the facility is located a minimum of four copies each of a permit application, engineering plans, and all supporting data and reports for the proposed construction, operation, or closure of the facility prepared by a professional engineer registered in the State of Florida in accordance with provisions of Chapter 471, F.S. Said engineer or another registered professional engineer shall be required to make periodic inspections during construction of the facility to ensure that design integrity is maintained.

(3) Preparation of application. The application for a permit shall be prepared and signed by the applicant on Form 62-673.900(1), Application for Permit to Construct/Operate a Phosphogypsum Stack System, effective 3-25-93, which is adopted and incorporated herein by reference. This form may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400. The application shall include all information necessary for the Department to make an evaluation of the proposed facility to ensure that it will pose no significant threat to public health or the environment. The permit application and supporting information shall include the following:

(a) A letter of transmittal to the Department.

(b) A table of contents listing the main sections of the application.

(c) The permit fee specified in Rule 62-4.050, F.A.C., in check or money order payable to the Department.

(d) Engineer and/or geologist seal. Where required by Chapters 471 or 492, F.S., data presented in support of the application shall be signed and sealed by the professional engineer or professional geologist who prepared or approved the data.

(e) All construction, operation, closure, and ground water monitoring plans, data, drawings, photographs, and reports to support the application.

(f) All maps, plan sheets, drawings, isometrics, or cross-sections to support the application, which shall be legible and:

1. Signed and sealed by the registered professional engineer responsible for their preparation. Wherever possible drawings should be no larger than 24 by 36 inches, folded to 9 by 12 inches. Illustrations, tables or drawings reduced in size should be no smaller than 8 1/2 by 11 inches;

2. Of appropriate scale to show clearly all required details;

3. Numbered, referenced to the narrative, and titled, with a legend of symbols used, horizontal and vertical scales (where applicable), and drafting or origination dates; and

4. Use uniform scales as much as possible, contain a north arrow, and use National Geodetic Vertical Datum (NGVD) as a basis for all elevations.

(g) A map or aerial photograph of the area showing land use and zoning within one mile of the phosphogypsum stack system. This map, or photograph which shall be taken within one year of the permit application, shall be of sufficient scale to show all homes, industrial buildings, wells, water courses, dry runs, rock out-croppings, roads and other significant details. All significant features shall be indicated and labeled on the map or aerial photograph.

(h) A plot plan of the phosphogypsum stack system site showing dimensions, original elevations, proposed final contours and location of soil borings. Cross sections shall be included on the plot plan or on separate sheets showing both the original and proposed elevations. The scale of the plot plan shall not be greater than 200 feet to the inch.

(i) Topographic maps at a scale of not over 200 feet to the inch with five-foot contour intervals. These maps shall show at least: the proposed phosphogypsum stack system area; access roads; grades required for proper drainage; and a typical cross section of any phosphogypsum stacks, cooling ponds, and process wastewater drainage conveyances.

(j) A hydrogeological investigation in accordance with Rule 62-701.410, F.A.C., which is incorporated by reference herein.

(k) A geotechnical investigation in accordance with Rule 62-701.420, F.A.C., which is incorporated by reference herein.

(l) Evidence of an approved laboratory to do ground water monitoring in accordance with Rule 62-160, F.A.C.

(m) A demonstration of ownership or control of the property.

(n) Financial documents assigned to the Department which ensure the financial responsibility for the closing and long-term care of the phosphogypsum stack system.

(4) Notice of application. An applicant for a permit to construct, expand, or close a phosphogypsum stack system shall publish and provide proof of publication to the Department, at its own expense, a Notice of Application in a newspaper of general circulation in accordance with Rule 62-103.150, F.A.C.

(5) Construction, operation and closure permits. After receipt of a complete application to construct, operate, expand, or close a phosphogypsum stack system, the Department shall:

(a) Issue a construction and operation permit for a new or expanded phosphogypsum stack system. After all significant initial construction has been completed and before operation, the engineer shall complete a Certificate of Construction Completion, Form 62-673.900(2), Certification of Construction Completion for a Phosphogypsum Stack System, effective 3-25-93, which is adopted and incorporated herein by reference, and contact the Department to arrange for Department representatives to inspect the facility in the company of the permittee and the engineer. This form may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400. The inspection is to ensure that the facility has been constructed in accordance with the approved permit. The facility shall not be operated or accept phosphogypsum or process wastewater except as necessary for construction and testing until the Department has found that all applicable submissions required for the permit, including financial responsibility documentation, have been received and found acceptable; or

(b) Issue an operation permit for a new or expanded phosphogypsum stack system that has been satisfactorily constructed, or to an existing system which is being operated in accordance with applicable portions of this chapter at the time for renewal of their permit; or

(c) Issue a closure permit for closing and long-term care of the system that has satisfied the requirements of Rules 62-673.600-.640, F.A.C. Permits shall be renewed in accordance with Rule 62-4.070, F.A.C.; or

(d) Deny the issuance of a permit if reasonable assurances are not provided that the applicable requirements of Chapters 62-4 and 62-673, F.A.C., will be satisfied.

(6) The design dimensions of a phosphogypsum stack system and the dimensions of the ground water vertical and horizontal zone of discharge shall be established in the permit for any new phosphogypsum stack system or lateral expansion of an existing system. A zone of discharge for an existing installation shall be established or modified in accordance with Rule 62-522.500, F.A.C., at the time of permit renewal, or at the time of issuance of a temporary operating permit.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.320, Amended 1-16-97.

62-673.340 Phosphogypsum Stack System General Criteria.

(1) Performance standards. A phosphogypsum stack system shall be designed, constructed, operated, maintained, closed, and monitored throughout its design period to control the movement of waste and waste constituents into the environment so that ground water and surface water quality standards and criteria of Chapters 62-520 and 62-302, F.A.C., will not be violated beyond the applicable zone of discharge specified for the system.

(2) Location requirements.

(a) Set back distances shall be maintained between the phosphogypsum stack system and the property boundary of sufficient width to allow for location of ground water monitoring wells in a manner that will enable detection of ground water quality changes before contaminant transport to the boundary of the permittee's zone of discharge.

(b) No part of a phosphogypsum stack system shall be located in the 100-year flood plain where it will restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the flood plain unless compensating storage is provided, or result in a washout of any part of the system.

(c) After completion of construction, phosphogypsum stack systems shall not be located within 200 feet of any natural or artificial surface water of the state, except bodies of water contained completely within the property boundaries of the facility which do not discharge from the site to surface waters unless special design features are used to assure that construction and operation of the system will not result in a violation of applicable water quality standards.

(d) Phosphogypsum stack systems shall not be located within 500 feet of an existing or approved shallow water supply well used for drinking water unless disposal takes place in a phosphogypsum stack system for which a complete permit application was filed, or which was originally permitted, before the shallow water supply well was in existence.

(3) Operation plan. The owner or operator of a phosphogypsum stack system shall have an operation plan that provides written, detailed instructions for the daily operation of the system. The operation plan shall be kept at or near the facility and shall be accessible to operators of the system.

(4) Ground water monitoring.

(a) Monitor well location, construction, and the collection and testing of samples shall be as specified in Rule 62-522.600 and 62-4.246, F.A.C., and Chapter 62-160, F.A.C.

(b) All ground water monitoring data shall be displayed in graphic form for analyzing trends in water quality.

(c) When requested by the Department the facility operator shall inform the Department of the next sampling schedule so that a representative of the Department may be present to collect a split sample.

(5) Surface water management. Phosphogypsum stack systems shall be operated to provide for the collection, control, recycling and treatment of surface runoff from the site as necessary to meet the applicable water quality standards of Chapters 62-520 and 62-302, F.A.C.

(6) Leachate management. Any leachate emanating from a phosphogypsum stack system shall be collected and routed to a cooling pond or surge pond, contained and treated as necessary to meet the applicable water quality standards of Chapters 62-302, 62-520, and 62-660, F.A.C.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.340, Amended 12-11-96.

62-673.400 Phosphogypsum Stack System Construction Requirements.

(1) Minimum design standards. The requirements of this rule are the minimum standards for constructing a phosphogypsum stack system. Nothing in this rule shall be construed to prevent the Department from imposing more stringent standards if necessary to protect the environment and the public health and safety due to site specific conditions. An applicant whose system design meets the design standards of this rule will be presumed to provide reasonable assurance that the performance standards of Rule 62-673.340(1), F.A.C., will be met. This presumption may be overcome through a demonstration that site-specific or situation-specific circumstances require the imposition of stricter standards in order to provide such reasonable assurances.

(2) Liner and leachate control systems. Phosphogypsum stacks shall be constructed with composite liners and leachate control systems. Cooling ponds shall be constructed with composite liners.

(a) Liners shall be:

1. Constructed of materials that have appropriate physical, chemical, and mechanical properties to prevent failure due to physical contact with the phosphogypsum, process wastewater or leachate to which they are exposed, climatic conditions, the stress of installation, and other applied stresses and hydraulic pressures which are anticipated during the operational and closure period of the system. The supplier of materials for the liner components shall provide test information accepted by the engineer of record, that supports the capabilities of the materials to meet these needs;

2. Installed upon a base and in a geologic setting capable of providing structural support to prevent overstressing of the liner due to settlements and applied stresses;

3. Constructed so that the bottom of the liner system is not subject to fluctuations of the ground water so as to adversely impact the integrity of the liner system;

4. Designed to resist hydrostatic uplift if the liner is located below the seasonal high ground water table; and

5. Installed to cover all surrounding earth which could come into contact with the phosphogypsum, process wastewater or leachate.

(b) Liner design standards. The synthetic component of composite liners shall consist of a 60-mil or thicker geomembrane liner with a maximum water vapor transmission rate of .24 grams per square meter per day as determined by ASTM Method E96-80, procedure BW, "Test Methods for Water Vapor Transmission of Materials," Sections 04.06, 08.03, and 15.09, which document is incorporated herein by reference. The other component of the composite liner shall consist of either of the following:

1. A layer of compacted soil at least eighteen inches thick, placed below the geomembrane, with a maximum hydraulic conductivity of 1×10^{-7} centimeters per second, constructed in six-inch lifts. The geomembrane liner component shall be installed in direct and uniform contact with the compacted soil component to retard leachate migration if a leak in the flexible membrane liner should occur.

2. A layer of mechanically compacted phosphogypsum at least 24 inches thick, placed above the geomembrane, with a maximum hydraulic conductivity of 1×10^{-4} centimeters per second.

(c) Any proposed composite liner design shall be accompanied by a detailed construction quality assurance plan prepared in accordance with the requirements of Rule 62-701.400(8), F.A.C., describing in detail how the design will be properly constructed in the field. For composite liners using compacted phosphogypsum, the quality assurance plan shall place particular emphasis on protection of the geomembrane during placement and compaction of the phosphogypsum, and on prompt placement of phosphogypsum on the geomembrane.

(d) The following liner design standards are adopted by reference and incorporated herein:

1. Rule 62-701.400(3)(d), F.A.C., standards for geomembranes, except for subparagraphs 2. and 3.;

2. Rule 62-701.400(3)(e), F.A.C., specifications for geosynthetic components. In addition, the synthetic liner material shall be subjected to continuous spark testing at the production facility prior to delivery to the site for installation. If the continuous spark testing detects any defect, the tested material must be rejected and not delivered to the site;

3. Rule 62-701.400(3)(f), F.A.C., standards for soil components;

4. Rule 62-701.400(7), F.A.C., liner systems construction quality assurance; and

5. Rule 62-701.400(8), F.A.C., soil liner construction quality assurance.

(e) Leachate control system standards.

1. A perimeter underdrain system designed to stabilize the side slopes of the phosphogypsum stack shall be installed above the geomembrane liner.

2. Perimeter drainage conveyances used in the leachate control system shall either consist of covered or uncovered ditches which are lined continuously with the phosphogypsum stack liner, or of chemically compatible leachate collection pipes. Covered ditches shall have maintenance manholes installed at appropriate intervals. Piped systems shall have manholes or appropriate cleanout structures at appropriate intervals. In the event that unusual site specific hydrogeologic or structural conditions exist, the Department reserves the right to impose stricter standards consistent with obtaining appropriate reasonable assurance that ground water and surface water quality standards will be met.

3. All toe drain or leachate collection systems must be constructed within the lined system.

(f) Liquid containment and conveyance systems.

1. Composite liners shall be used on all liquid containments and conveyances associated with phosphogypsum transport, cooling water, and return of process wastewater. Exceptions are pumped flow systems contained in pipes.

2. Pump and piping systems associated with the transport of phosphogypsum or process wastewater and which cross surface waters must be double contained with chemically compatible materials in a manner that assures that all materials under pumped flow are contained within a lined system in the event of a leak or piping system failure.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.400.

62-673.600 Closure of Phosphogypsum Stacks.

(1) Applicability. Rules 62-673.600-62-673.650, F.A.C., are applicable to all existing phosphogypsum stack systems, active or inactive, except those closed or required to be closed under a Department permit or pursuant to a consent order in effect before 3-25-93. These rules also apply to all construction permit applications for new phosphogypsum stack systems.

(2) By September 21, 1993, owners or operators of inactive phosphogypsum stack systems shall submit a closure permit application to the Department on Form 62-673.900(3), Application for Permit to Close a Phosphogypsum Stack System, effective 3-25-93, which is adopted and incorporated herein by reference. This form may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400. The application shall include a closure plan as specified in Rule 62-673.610, F.A.C.

(3) By September 21, 1993, owners or operators of active phosphogypsum stack systems shall submit general plans and schedules for closure of the facility and shall comply with Rule 62-673.640, F.A.C.

(4) Applicants for construction permits for new phosphogypsum stack systems or lateral expansions of existing systems shall include in the application general plans and schedules for closure of the facility, and shall comply with Rule 62-673.640, F.A.C.

(5) At least 90 days before the deactivation of a phosphogypsum stack system, the owner or operator shall submit a closure permit application including a closure plan to the Department to comply with Rule 62-673.610, F.A.C. For purposes of this section, a phosphogypsum stack system is considered inactive when it is no longer receiving phosphogypsum and when the owner or operator does not intend to, and in fact does not, deposit any significant quantity of phosphogypsum there within one year.

(6) The owner or operator of a phosphogypsum stack system may request in writing a determination by the Department that the provisions of subsection (5) of this section shall not apply, and shall request approval of a temporary deactivation of the phosphogypsum stack system on a yearly basis. The Department shall authorize by order each temporary deactivation approved for an individual phosphogypsum stack system in accordance with this paragraph or shall deny by order the request for such approval. Each request shall set forth at least the following information:

(a) The specific phosphogypsum stack system or phosphogypsum stack for which approval is sought;

(b) A demonstration that current economic conditions justify a temporary deactivation of the phosphogypsum stack system;

(c) An estimate of the duration of the temporary deactivation of the phosphogypsum stack system, and a demonstration that the stack system is reasonably expected to become active within this estimated time period; and

(d) A description of the measures to be taken to assure that the phosphogypsum stack system will pose no significant threat to the public health and the environment during the temporary deactivation.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.600, Amended 1-16-97.

62-673.610 Closure Plan Requirements.

All closure plans shall address the following requirements, or shall contain an explanation of why the requirement is not applicable. Valid information on record in an existing permit or approved groundwater monitoring plan may be used to satisfy the applicable requirements of this rule.

(1) General information report. This report shall contain:

(a) Identification of the phosphogypsum stack system;

(b) Name, address and phone number of primary contact persons;

(c) Identification of persons or consultants preparing this report;

(d) Present property owner and phosphogypsum stack system operator;

(e) Location by township, range and section, and latitude and longitude of the phosphogypsum stack system;

(f) Total acreage of the phosphogypsum stack system and total acreage of the facility property;

(g) Legal description of the property on which the phosphogypsum stack system is located; and

(h) History of the phosphogypsum stack system, including construction dates and a general description of operations.

(2) Area information report. A report on the area in which the phosphogypsum stack system is located shall be included in the closure plan. The report may use verifiable information available from published documents. The term "area" means that area which may affect or be affected by the phosphogypsum stack system, and at a minimum includes the land within a one-mile radius of the phosphogypsum stack system. The report shall be supplemented by maps and cross-section drawings. The following topics shall be addressed in the report:

(a) Topography;

(b) Hydrology, including surface water drainage patterns and hydrologic features such as surface waters, springs, drainage divides and wetlands;

(c) Geology, including the nature and distribution of lithology, unconsolidated deposits, major confining units and sinkholes;

(d) Hydrogeology, including depth to groundwater table, groundwater flow directions, recharge and discharge areas used by public and private wells within one mile of the phosphogypsum stack system;

(e) Ground and surface water quality;

(f) Land use information. The report shall include a discussion and maps indicating:

1. Identification of adjacent landowners;

2. Zoning;

3. Present land uses; and

4. Roads, highways, right-of-ways, or other easements.

(3) Groundwater monitoring plan and site specific information. The closure plan shall include an approved groundwater monitoring plan containing site specific information which meets the criteria specified in Rule 62-522.600(3), F.A.C.

(4) Assessment of effectiveness of existing phosphogypsum stack system design and operation. Based on the area information report and the groundwater monitoring plan, an assessment shall be prepared which discusses the effects of the phosphogypsum stack system on adjacent ground and surface waters, and the phosphogypsum stack system area. Specific concerns to be addressed are:

(a) Effectiveness and results of the groundwater investigation; and

(b) Effects of surface water runoff, drainage patterns, and existing storm water controls.

(5) Closure plan performance standards. The closure plan and closure design plan shall be developed to meet the following performance standards.

(a) Closure plans for phosphogypsum stack systems shall be designed to:

1. Control, minimize or eliminate, to the extent necessary to protect human health and the environment, the post closure escape of phosphogypsum, process wastewater, leachate, and contaminated runoff to ground and surface waters;

2. Minimize leachate generation;

3. Detect, collect, and remove leachate and process wastewater efficiently from the phosphogypsum stack system, and promote drainage of process wastewater from the phosphogypsum stack;

4. Be compatible with any required ground water or surface water corrective action plan;

5. Minimize the need for further maintenance.

(b) Closure plans for phosphogypsum stacks shall include a final cover system designed to:

1. Promote drainage off the stack;

2. Minimize ponding;

3. Minimize erosion;

4. Minimize infiltration into the phosphogypsum stack;

5. Function with little or no maintenance.

(c) Closure plans for ponds and drainage conveyances storing process wastewater shall be designed to:

1. Treat or remove from the ponds and drainage conveyances all process wastewater as soon as practical, either through return of the process wastewater to the manufacturing process, transfer of process wastewater to another pond permitted in accordance with this rule, in-situ treatment, or by treatment and subsequent discharge of the process wastewater under an appropriate discharge permit;

2. Place any sludges removed from a pond or drainage conveyance into an active phosphogypsum stack permitted in accordance with this rule, or an inactive stack undergoing closure in accordance with this rule. The closure plan shall contain a detailed description of procedures for removing or treating the sludges, methods for sampling and testing surrounding soils, and criteria for determining the extent of removal required to satisfy the closure performance standards.

(6) Closure design plan. A closure design plan shall be prepared to meet the closure plan performance standards and shall be based on the area information report, groundwater monitoring plan, and assessment of the effectiveness of the existing phosphogypsum stack system design and operation. The closure design plan shall consist of engineering plans and a report on closing procedures which shall apply to the closing of the phosphogypsum stack system and the monitoring and maintenance during the long-term care period. The closure design plan shall include the following information:

(a) A plan sheet showing phases of site closing.

(b) Drawings showing existing topography and proposed final elevations and grades.

(c) For phosphogypsum stacks, final cover installation plans showing the sequence of applying final cover, including thickness and type of material that will be used. All phosphogypsum stacks shall have a final cover designed to meet the performance standards. Final cover shall be placed over the entire surface of the phosphogypsum stack. The final cover shall be vegetated with drought-resistant species to control erosion, whose root systems will not penetrate any low-permeability barrier layer. Water balance calculations, based on available climatic data, shall be prepared which estimate the rates and volumes of water infiltrating the cover systems, collected by any leachate control system, and migrating out of the bottom of the stack or liner system. Final cover may consist of synthetic membranes, soils, or chemically or physically amended soils or phosphogypsum.

1. Side slopes and all other grades shall be designed to minimize erosion of the final cover material. Such designs shall consider the erosion susceptibility of the material proposed for final cover relative to historical rainfall patterns for the area, the ability to establish and maintain vegetation and special maintenance procedures proposed to insure that infiltration and erosion are minimized. If the side slopes of any stack are steeper than a two-foot horizontal run to one foot vertical rise, the closure design plan shall include a stability analysis demonstrating the longterm stability of the area.

2. Top gradients of final cover on phosphogypsum stacks shall be designed to prevent ponding or low spots and minimize erosion.

a. The final cover on the top gradient shall consist of a barrier soil layer at least 18 inches thick, emplaced in 6-inch thick lifts. A final, 18-inch thick layer of soil or amended phosphogypsum that will sustain vegetation to control erosion shall be placed on top of the barrier layer. For unlined stacks, the barrier layer shall have a maximum permeability of 1×10^{-7} cm/sec; for lined stacks, the barrier layer shall have a maximum permeability of 1×10^{-5} cm/sec. If less permeable soils are used, the thickness of the barrier layer may be decreased to 12 inches provided that infiltration is minimized to an equivalent degree.

b. A geomembrane may be used as an alternative to the low-permeability soil barrier for a final cover, constructed to preclude rainfall infiltration into the stack. A geomembrane used in final cover shall be a semi-crystalline thermoplastic at least 40 mils thick, or a non-crystalline thermoplastic at least 30 mils thick, with a maximum water vapor transmission rate of 2.4 grams per square meter per day, have chemical and physical resistance to materials it may come in contact with, and withstand exposure to the natural environmental stresses and forces throughout the installation, seaming process, and settlement of the phosphogypsum during the closure and long-term care period. A protective soil layer at least 24 inches thick shall be put on top of the geomembrane. Material specifications, installation methods, and compaction specifications shall be adequate to protect the barrier layer from root penetration, resist erosion, and remain stable on the final design slopes. This layer shall include soils or amended phosphogypsum that will sustain vegetative growth.

3. The closure design plan shall describe provisions for cover material for long-term care erosion control, filling other depressions, maintaining berms, and general maintenance of the phosphogypsum stack, and shall specify the anticipated source and amount of material necessary for proper closure of the stack.

(d) The type of leachate control system proposed. The leachate control system shall be designed to prevent leachate from causing violations of water quality standards beyond the approved zone of discharge for the phosphogypsum stack system in accordance with Chapters 62-520 and 62-522, F.A.C.

(e) Compliance with groundwater protection requirements. The closure design plan shall show how the phosphogypsum stack system will meet the water quality standards of Chapter 62-520, F.A.C. The groundwater monitoring plan and sampling schedule may be adjusted for a phosphogypsum stack system where groundwater contamination is not evident or corrective measures have been taken to correct contamination.

(f) The proposed method of stormwater control. This shall include control of stormwater occurring on the phosphogypsum stack system. Stormwater or other surface water which mixes with leachate shall be considered to be leachate and shall be treated to meet the applicable water quality standards of Chapter 62-302, F.A.C., at the point of discharge. The stormwater control plan shall meet the requirements of Chapter 62-25, F.A.C.; however, nothing herein shall be construed to preclude application of the requirements of the appropriate water management district.

(g) The proposed method of access control. The closure design plan shall describe how access to the closed phosphogypsum stack system shall be restricted to prevent any future waste dumping or use of the phosphogypsum stack system by unauthorized persons. Restricted access shall remain in force until the phosphogypsum stack system is stabilized and there is no evidence that the property is being used as an unauthorized dump site.

(h) A description of any proposed final use of the phosphogypsum stack system.

(i) Closure construction quality assurance plan. A detailed construction quality assurance plan shall be developed for construction activities associated with the closure of the phosphogypsum stack system, including each component of the final cover system. The plan shall specify quality assurance test procedures and sampling frequencies. Records shall be kept to document construction quality and demonstrate compliance with plans and specifications. Upon completion of closure activities a final construction quality assurance report shall be submitted to the Department, prepared by a registered professional engineer. The final report shall include at least the following information:

1. Listing of personnel involved in closure construction and quality assurance activities;
2. Scope of work;
3. Outline of construction activities;
4. Quality assurance methods and procedures;

5. Test results (destructive and non-destructive, including laboratory results); and

6. Record drawings.

(7) Closure operation plan. A closure operation plan shall be included in the closure plan, and shall:

(a) Describe the actions which will be taken to close the phosphogypsum stack system, such as placement of cover, grading, construction of berms, ditches, roads, retention-detention ponds, installation or closure of wells and boreholes, installation of fencing or seeding of vegetation, protection of on-site utilities and easements;

(b) Provide a time schedule for completion of the closing and long-term care;

(c) Contain appropriate references to the closure design plan, area information report, groundwater monitoring plan, and other supporting documents;

(d) Describe the proposed method of demonstrating financial responsibility for the long-term monitoring and maintenance;

(e) Indicate any additional equipment and personnel needed to complete closure of the phosphogypsum stack system; and

(f) Describe any proposed use of the system for water storage or water management.

(8) Certification by registered professional engineer. Information, plans, and drawings presented in support of a closure plan shall be prepared under the direction of, and certified by, a registered professional engineer authorized to practice in the State of Florida in accordance with the provisions of Chapter 471, F.S. A letter of appointment shall be submitted by the proper company official confirming that the engineer is authorized to prepare plans and specifications. The professional engineer or another qualified engineer shall be required to make periodic inspections during the closing of the phosphogypsum stack system to insure closure is being accomplished according to the closure plan.

(9) Nothing in the section is intended to preclude the construction of a lined cooling pond on top of an inactive phosphogypsum stack, as long as the pond is constructed in accordance with the applicable provisions of this chapter, and as long as the design is included in the closure plan. Within such a cooling pond, the requirements for minimizing ponding and establishing vegetation cover are not applicable.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.610.

62-673.620 Closure Procedures.

(1) Closing inspections. The Department shall specify in the closure permit or closure plan which particular closing steps or operations must be inspected and approved by the Department before proceeding with subsequent closure actions.

(2) Final survey and record drawings. A final survey shall be performed after closure is complete by an engineer or a registered land surveyor to verify that final contours and elevations of the phosphogypsum stack system are in accordance with the plan as approved in the permit. Aerial mapping techniques which provide equivalent survey accuracy may be substituted for the survey. The survey or aerial mapping information shall be included in a report along with information reflecting the record drawings of the phosphogypsum stack system. Contours should be shown at no greater than five-foot intervals. The owner or operator shall submit this report to the Department in accordance with the closing schedule.

(3) Certification of closure construction completion. A certification of closure construction completion, signed, dated and sealed by the engineer of record, shall be provided to the Department upon completion of closure.

(4) Official date of closing. Upon receipt of the documents required in subsections (2) and (3) of this section, the Department shall, within 30 days, acknowledge by letter to the facility operator that notice of termination of operations and closing of the phosphogypsum stack system has been received. The date of this letter shall be the official date of closing for purposes of determining the long-term care period.

(5) Use of closed phosphogypsum stack systems. Closed phosphogypsum stack systems, if disturbed, are a potential hazard to public health, groundwater and the environment. The Department retains regulatory control over any activities which may affect the integrity of the environmental protection measures such as the final cover, drainage, liners, monitoring system, or leachate and stormwater controls. Consultation with the Department is required before conducting activities at the closed phosphogypsum stack systems.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.620.

62-673.630 Long-Term Care.

(1) Long-term care period. The owner or operator of any phosphogypsum stack system subject to the requirements of Rules 62-673.600-.620, F.A.C., shall be responsible for monitoring and maintenance of the facility in accordance with an approved closure plan for 50 years from the date of closing. Before the expiration of the long-term care monitoring and maintenance period the Department may extend the time period if the closure design or closure operation plan is found to be ineffective.

(2) Reduced long-term care period. The owner or operator of a phosphogypsum stack system may apply to the Department for a reduced long-term care schedule if reasonable assurance is provided to the Department that there is no significant threat to human health or the environment and if the phosphogypsum stack system:

(a) Has been constructed and operated in accordance with approved standards, has a leachate control system and a liner;

(b) Was closed with appropriate final cover, vegetative cover has been established, and a monitoring system has been installed;

(c) Has a 20-year history after closure of no violations of water quality standards or criteria detected in the monitoring system, and no increases over background water for any monitoring parameters which may be expected to result in violations of water quality standards or criteria; and

(d) Has had no detrimental erosion of cover.

(3) Right of access. The owner or operator of the phosphogypsum stack system shall possess or acquire a sufficient interest in, or a right to use, the property for which a permit is issued, including the access route onto the property to carry out the requirements of this rule. The permittee shall retain the right of entry to the phosphogypsum stack system for the long-term care period, after termination of disposal operations, for inspection, monitoring and maintenance of the site.

(4) Successors in interest. Any person acquiring rights or ownership, possession or operation of a permitted phosphogypsum stack system through lease or transfer of property shall be subject to all requirements of the permit for the facility and shall provide any required proof of financial responsibility to the Department in accordance with this rule. Any lease or transfer of property shall include specific conditions to delineate:

(a) The previous owner or operator is responsible for closure and shall maintain any required proof of financial responsibility until the person acquiring ownership, possession or operation of the phosphogypsum stack system establishes the required proof of financial responsibility with the Department;

(b) Responsibility for the continuance of monitoring, maintenance, and correction of deficiencies or problems; and

(c) Mineral rights attached to the property and the rights to any recoverable materials that may be buried on the property. A Department permit shall be required if any on-site operations subsequent to closure involve disturbing the phosphogypsum stack system.

(5) Transfer of permit. Transfer of the phosphogypsum stack system permit shall be in accordance with the provisions of Rule 62-4.120, F.A.C., and this rule.

(6) Replacement of monitoring devices. If a monitoring well or other device required by the monitoring plan is destroyed or fails to operate for any reason, the phosphogypsum stack system owner or operator shall, immediately upon discovery, notify the Department in writing. All inoperative monitoring devices shall be replaced with functioning devices within 60 days of the discovery of the malfunctioning unit unless the owner or operator is notified otherwise in writing by the Department.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.630.

62-673.640 Financial Responsibility.

(1) As a condition for the issuance of a construction permit for a phosphogypsum stack system, or for approval of a closure permit or closure plan, the owner or operator shall post a bond with the Department equal to the estimated costs of closing and long-term care of the phosphogypsum stack system. The bond shall comply with the requirements of 40 C.F.R. Part 264, Subpart H, as adopted by reference in subsection (4) of this section.

(2) Cost estimates.

(a) The owner or operator shall estimate the total cost of closure for the phosphogypsum stack system for the time period in the operation when the extent and manner of its operation make closing most expensive. The annual cost of long-term care shall be estimated and listed separately, and multiplied by 50 years. The owner or operator shall submit the estimates, together with all necessary justification, to the Department for approval along with the proof of financial responsibility. The costs shall be estimated by a professional engineer registered in the State of Florida in accordance with provisions of Chapter 471, F.S., for a third party performing the work, on a per unit basis, with the source of estimates indicated.

(b) Closing costs shall include estimated costs of cover material, topsoil, seeding, fertilizing, mulching, labor, and any other costs of compliance with Rules 62-673.610 and 62-673.620, F.A.C.

(c) Long-term care costs shall include land surface care, leachate pumping, transportation, monitoring and treatment, groundwater monitoring, collection and analysis, and any other costs of compliance with Rule 62-673.630, F.A.C.

(3) Cost adjustments.

(a) During the life of the phosphogypsum stack system, the owner or operator shall revise the closure cost estimate for inflation and changes in the closure and long-term care plan. Such revisions shall be made at the time of permit renewal and used as the basis for comparison against the amount of the bond or the value of an alternative funding mechanism.

(b) If the value of the bond or alternate funding mechanism is less than the total amount of the current closure cost estimate, the owner or operator shall revise the funding mechanisms to reflect the new estimate within the time frames outlined in 40 C.F.R. Part 264, Subpart H.

(c) If the value of the bond or alternate funding mechanism is greater than the total amount of the current closure cost estimate, the owner or operator may reduce the value of the bond or funding mechanism to reflect the new estimate.

(4) Alternative proof of financial responsibility.

(a) An owner or operator may request an alternate proof of financial responsibility in lieu of, or in combination with, the requirements of subsection (1) of this section. Such alternate proof may include letters of credit, trust fund agreements, closure insurance or financial tests and corporate guarantees showing that the owner or operator has sufficient financial resources to cover,

at a minimum, the costs of complying with all closure and long-term care requirements. These shall be submitted on forms provided by the Department in accordance with the requirements of paragraphs (b) and (c) of this subsection. The owner or operator shall estimate such costs pursuant to subsection (2) of this section.

(b) 40 C.F.R. Part 264 Subpart H which contains EPA's rules on financial requirements for owners and operators of hazardous waste facilities are hereby adopted and incorporated by reference as those rules appear in 40 C.F.R. 264, revised as of July 1, 1988, except:

1. The following sections of 40 C.F.R. Part 264 Subpart H are specifically not adopted as part of this rule:

a. 264.140(a); 264.140(b); 264.141(a); 264.141(e); 264.147; 264.149; 264.150; and 264.151.

b. All references to 40 C.F.R. Part 265.

c. All references to sections or subparts of 40 C.F.R. 264 not contained in Subpart H.

d. All references to EPA Regions.

e. All references to RCRA or Section 3008 of RCRA.

2. References in 40 C.F.R. 264 Subpart H to the United States Environmental Protection Agency (EPA) shall mean the State of Florida Department of Environmental Protection; to Regional Administrator shall mean the Secretary of the Department; to RCRA permits shall mean phosphogypsum stack system permits; to post-closure care/post-closure cost estimate shall mean long-term care/long-term cost estimate; to EPA identification number shall mean the Department identification number; to hazardous waste shall mean phosphogypsum; and to hazardous waste treatment, storage or disposal facilities shall mean phosphogypsum stack systems.

(c) The series of financial responsibility forms, form 62-673.900(4)(a)-(h), which are adopted and incorporated herein by reference, shall be used when submitting proof of financial responsibility under this rule. This form and its parts may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400.

1. Form 62-673.900(4)(a), Trust Fund Agreement to Demonstrate Closure and/or Post-Closure Financial Assurance, effective 1-16-97.

2. Form 62-673.900(4)(b), Standby Trust Fund Agreement, effective 1-16-97.

3. Form 62-673.900(4)(c), Irrevocable Letter of Credit, effective 3-25-93.

4. Form 62-673.900(4)(d), Closure/Post-Closure Insurance Certificate, effective 3-25-93.

5. Form 62-673.900(4)(e), Financial Guarantee Bond, effective 3-25-93.

6. Form 62-673.900(4)(f), Performance Bond, effective 3-25-93.

7. Form 62-673.900(4)(g), Letter from Chief Financial Officer, effective 3-25-93.

8. Form 62-673.900(4)(h), Corporate Guarantee, effective 3-25-93.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 3-25-93, Formerly 17-673.640, Amended 1-16-97.

62-673.650 Closure of Unlined Systems.

(1) Closure of existing systems. No phosphogypsum or process wastewater shall be placed in an unlined phosphogypsum stack system after March 25, 2001; however, such systems may be used for water storage and water management purposes to facilitate closure. Final closure of each unlined system shall be completed as expeditiously as practicable and no later than five years after it ceases accepting phosphogypsum. For purposes of this subsection, "unlined" means that the phosphogypsum stack or cooling pond was constructed without an installed liner made of synthetic materials, soils, or a combination of these and approved by the Department at the time of construction.

(2) The provisions of subsection (1) of this section shall not apply to a phosphogypsum stack system, or any portion of that system, if the owner or operator of that system demonstrates to the Department that:

(a) Such system was not causing any violation of a Department water quality standard or criterion on March 25, 1993, and is not reasonably expected to cause any such violation after March 25, 1993; or

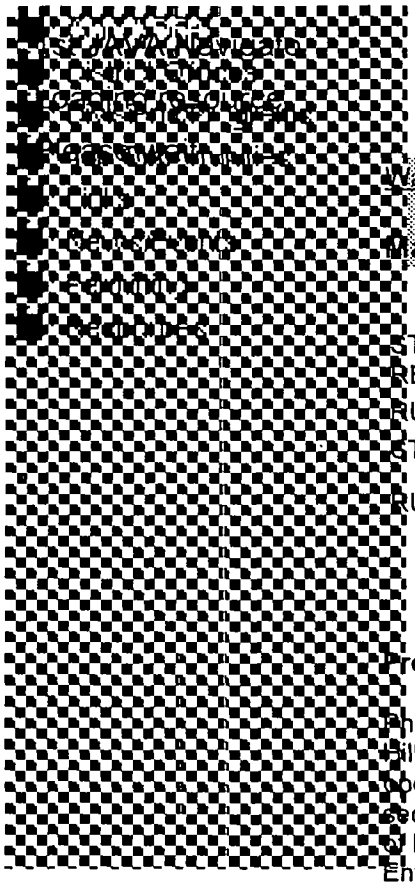
(b) The owner or operator will implement corrective measures which will contain seepage from the stack system at or within the permitted zone of discharge and, through further corrective measures or as a result of natural processes, ground water quality at the edge of the permitted zone of discharge will be in compliance with all applicable Department standards and criteria by March 25, 2001.

(3) The demonstrations authorized by subsection (2) of this section may be made through a permit application or through submittals required by a consent order or an amendment to an existing consent order issued by the Department.

(4) Nothing in this section shall be construed to limit the Department's authority to require closure of any phosphogypsum stack system as part of an enforcement action as necessary to protect the public health or the environment.

Specific Authority 403.4154, 403.704, 403.061 FS. Law Implemented 403.4154, 403.707 FS. History–New 8-1-93, Formerly 17-673.650.

Water Resource Management



Mandatory Phosphate

STATUTE FOR RECLAMATION:	Chapter 378, Part III, F.S.
RULE FOR RECLAMATION:	Chapter 62C-16, F.A.C.
STATUTE FOR PERMITTING:	Chapter 373, Part IV, F.S.
RULES FOR PERMITTING:	Chapters 62-312, 62-4,62-343,62-341,40X -4. F.A.C.

Download Mine Reclamation Rules

Program Description:

Phosphate mining occurs primarily in the central Florida area (in Polk, Hillsborough, Manatee, and Hardee counties). One mining company operates in North Florida (Hamilton county). The mandatory phosphate section is responsible for administering the rules related to the reclamation of lands mined for phosphate after June 1975 and the rules related to Environmental and Wetland Resource Permits for phosphate mined lands.

Phosphate mining disturbs 5,000 - 6,000 acres of land annually; approximately 25-30% of these lands are isolated wetlands or wetlands connected to waters of the state.

The mined landform is generally a series of steep-sloped spoil piles with water-filled troughs. Reclamation construction consists of recontouring and revegetation.

Program Personnel:

Cheri Albin	Environmental Administrator
Vacant	Administrative Secretary
Chris Cooksey	Environmental Specialist III
Christine Keenan	Environmental Specialist II
Doug Oliver	Biological Scientist III
Alan Whitehouse	Environmental Specialist III

Program Issues:

Technical issues include hydrology, water quality, wetland and other wildlife habitat replacement and mitigation, waste clay disposal. The Integrated Habitat Network (IHN) plan, prepared by the bureau, is the focus for the reclamation and permitting efforts for phosphate mining in Central Florida. The IHN provides for ecologically-based construction of wildlife corridors which are to be associated primarily with the land adjacent to the major river systems and their tributaries.

For more information, contact:
FDEP - Mine Reclamation Section
Collins Building
2051 E. Dirac
Tallahassee, FL 32310-3760

Phone (850) 487-3894
Fax (850) 488-1254

Bureau Office | Environmental Resources | Phosphate Management Program | Mandatory Phosphate
Mandatory Nonphosphate | Nonmandatory Reimbursement | Mine Safety | Technical Section

DEP Home Page | Division Home Page | Contact Web Administrator

Last Updated:
July 11, 2000

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*              October 20, 2000                          11:17am                 *
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USGS
Minerals Information

Phosphate Rock
Statistical Compendium

This publication includes data through 1990.
For recent statistics, please go the the Phosphate Rock Statistics and Information page.

The principal commercial deposits of phosphate rock exist in Florida, North Carolina, and Idaho, and to a lesser degree in Montana and Utah. Production of phosphate rock in Tennessee ended in 1991. Phosphate rock is mined, beneficiated, and either solubilized to produce wet-process phosphoric acid or smelted to produce elemental phosphoric acid or smelted to produce elemental phosphorous. Phosphoric acid is reacted with phosphate rock to produce the fertilizer triple superphosphate or with anhydrous ammonia to produce the ammonium phosphate fertilizers. Elemental phosphorus is the base for furnace-grade phosphoric acid, phosphorus pentasulfide, phosphorus pentoxide, and phosphorus trichloride. Approximately 90% of phosphate rock production is used for fertilizers and animal feed supplements and the balance for industrial chemicals.

U.S. phosphate rock production increased from 18 million metric tons in 1960 to 35 million metric tons in 1970 and peaked at 54 million metric tons in 1980. Consumption in 1990 was 44 million metric tons. Increasing tonnage of phosphate rock is used to produce higher value phosphatic fertilizers for the export market. Phosphate rock exports peaked in 1980 at 14 million metric tons and has declined to 6 million metric tons in 1990. Phosphate rock imports have historically been a minor factor in supply; however, in addition to small quantities of low-fluorine materials, phosphate rock imports in recent years increased to the .5-million-metric-ton level.

Phosphate rock prices in the 1960's were in the $5 to $6 per metric ton range, f.o.b. mine, and increased to the $20 to $25 per metric ton range, f.o.b. mine, in the 1980's.

The demand for phosphate rock as a nutrient for food production will vary throughout the world. The overall demand is forecast to increase in the 1%-to-2%-per-year range; however, in the agriculturally mature countries, the increase in demand will be closer to 1% per year.

The supply of phosphate rock is forecast to decline in the United States as existing mines in Florida are mined out and unfavorable economics discourage new mine development. World supply will be maintained from quality deposits in North Africa.

- Table 1 (TXT) -- U.S. phosphate rock historical data

Return to Statistical Compendium
Return to Phosphate Rock Information
Return to Minerals Information
Return to Mineral Resources Program
Return to Geologic Division
Return to USGS

U.S. Geological Survey
Minerals Information
983 National Center
Reston, VA 20192 USA
Commodity Specialist: Joyce A. Ober (jober@usgs.gov)
URL: http://minerals.er.usgs.gov/minerals/pubs/commodity/phosphate/stat/
Maintained by: jgambogi@usgs.gov
Last modification: 10/16/00
(PM)

Florida Institute of Phosphate Research

1998-2003

Strategic Research,

Programmatic & Management

Priorities

April 1998

Table of Contents

Florida Institute of Phosphate Research (FIPR) Overview

Introduction

The Florida Legislature created the Florida Institute of Phosphate Research (FIPR) in 1978 to initiate, conduct or sponsor studies to minimize or rectify any negative impact of phosphate mining and processing on the environment and improve the industry's positive impact on the economy. This includes developing better techniques for reclaiming land, and developing more efficient mining and processing technologies.

Florida's Governor appoints members of the Board of Directors that govern the Institute. The Board must include one state university system faculty member, one major Florida environmental group member, one regulatory member (customarily from the Florida Department of Environmental Protection), and two phosphate industry members. Board members serve three-year terms, but may be re-appointed.

The state Legislature founded FIPR to determine the scientific facts associated with the phosphate industry's impact on the environment and the health and safety of Florida's citizens. FIPR is an independent state research organization with a mission to conduct, or cause to be conducted, studies that would improve phosphate industry efficiency, reduce its use of water and energy resources, and enhance efforts to reclaim the land that mining and processing affects. FIPR also is obligated to educate and inform Florida citizens about phosphate issues. Environmentalists, public officials, regulators, phosphate industry representatives, and the general public help determine FIPR's research priorities. FIPR holds periodic public workshops to solicit input from these groups to ensure that its research priorities are consistent with its mandate.

Research projects often pertain to more than one of FIPR's research areas - Mining/Beneficiation, Chemical Processing, Reclamation/Restoration and Environmental Services - because they have components that fit under more than one heading. For example, research on phosphogypsum, a by-product of phosphate fertilizer production, may include chemical processing of the phosphate, recycling or handling of the process water, using the by-product, or reclamation of a closed phosphogypsum stack.

Environmental concerns reflected by FIPR's research funding include wildlife habitat restoration, wetland reclamation, upland reclamation, waste clay pond reclamation, radiation (radon) associated with phosphate mining/processing, understanding hydrologic systems and water quality issues, and phosphogypsum stacks. Efforts to increase industry efficiency include examining column flotation and other techniques to improve phosphate recovery, finding energy-efficient ways to pump the ore, developing new techniques to reduce the amount of chemicals used, testing on-stream analytical methods for process control, defining ways to utilize by-products such as phosphogypsum, and developing technology to hasten clay consolidation.

Education

FIPR conducts seminars, conferences , and workshops on subjects pertaining to its research program. The Institute also has an education program aimed at using its scientific, environmental and technical expertise and information to enhance science and environmental studies in the schools and in the community.

Staff

FIPR has a dedicated staff of professionals, including chemists, biologists, engineers, librarians, a public information specialist, education coordinator, research assistants, and administrative personnel. The Institute has more than 25 full- and part-time employees.

Facilities

The Institute is located on the western edge of Bartow, Florida -- Polk County's seat and the heart of the phosphate mining district. FIPR occupies eight acres of land that once was mined and has been reclaimed.

The campus contains three buildings, housing administrative offices, a biological laboratory and greenhouse, a metallurgical laboratory and an analytical chemistry laboratory.

There is also a full-service library that contains the largest collection of phosphate-related information in the world. The library is open to the public with and has the ability to access technical references through extensive on-line resources and on the Internet. A description of the library services and its collection can be found on the FIPR Home Page at http://www.fipr.state.fl.us

Agency Strategic Plans

Under the provisions of Chapter 186, Section 186.022(1), Florida Statutes, the purpose of the Agency Strategic Plan (ASP) is to identify the strategic priority directions an agency will take to fulfill its mission within the context of the State Constitution, the State Comprehensive Plan (SCP), Florida Statutes, and other statutory mandates or authorizations. The plan must be consistent with and further the goals of the SCP. Further, each agency strategic plan must identify the specific legislative authority necessary to implement the provisions of the plan.

FIPR's 1998 - 2003 Strategic Research Priorities

Environment

Environment
Reclamation/Restoration
Public Health

Technology

Phosphogypsum and Process Water
Mining and Rock Processing Efficiency
Waste Clay Ponds

Beginning in July of 1997, FIPR scheduled and conducted a series of workshops (public, staff, advisory) to help facilitate revisions/updates to its strategic research and planning efforts. These workshops were extremely beneficial in obtaining direct input from all of FIPR's stakeholders. The major changes to this ASP provide for enhanced research and technology linkages to public benefit, environment, reclamation/restoration, and mining processes.

In December of 1997, FIPR began work to incorporate the provisions of Chapter 216, Florida Statutes, Performance Based Program Budgeting (PB ^{2}) into its planning and budgeting processes.

Notably, some previous supporting approaches for accomplishment of a particular objective have been completed and therefore have been deleted from the plan, while others have been modified or added to integrate related stakeholder inputs. FIPR's 1998-2003 Agency Strategic Plan (ASP) provides the

Mission that must be accomplished, describes the Institute's Strategic Research, Programmatic and Management Priorities with the accompanying strategic objectives and approaches to help ensure mission accomplishment.

Florida Institute of Phosphate Research

MISSION STATEMENT

"The mission of The Florida Institute of Phosphate Research (FIPR) is to maintain a leadership role in identifying, funding, disseminating and assuring the scientific validity of research that will:

- ***Result in the assessment and resolution of significant phosphate industry issues affecting the environment and the health and safety of the citizens of Florida;***
- ***Lead to the implementation of new technology that will be of joint benefit to the industry and to the citizens of Florida;***
- ***Benefit the economy, environment and welfare of the citizens of Florida."***

The Institute, a state agency, accomplishes this mission by:

1. Conducting research.
2. Facilitating the application of research results.
3. Coordinating FIPR activities with local, regional, state and national governmental agencies, and research organizations.
4. Disseminating research results to the industry, to government, to the research community, and to the public.
5. Maintaining an information center on FIPR's research mission areas of environment and technology.
6. Maintaining technical contacts worldwide to assure access to new developments that might be applicable to Florida phosphate concerns.

7. Conducting public education and information programs about issues of concern.

8. Conducting conferences and workshops for all interested and affected parties about the research results and priorities of the Institute.

9. Acting as a liaison among educational institutions, associations, industrial, governmental, and environmental entities.

Florida Institute of Phosphate Research

VALUES STATEMENT

We, the Board and Staff of the Florida Institute of Phosphate Research (FIPR), commit to the following values:

- Being an unbiased and competent source of technical information on FIPR's mission areas including technology, environment and public health.
- Being recognized for our openness and integrity by both the public and the industry.
- Ensuring that the work of the Institute done by its staff or outside contractors is of high quality and can withstand critical technical peer review.
- Trusting and respecting each other individually and as team members who work together to fulfill our mission.
- Continuing to assess our progress as a research institute by reviewing our priorities and operations on a regular basis and making changes as necessary.
- Being receptive to the thoughts and ideas of the public, the environmental community, the industry, the education community, the legislature, and the regulatory and governmental agencies.
- Creating a legacy that will enhance the quality of life for the citizens of Florida and their future generations.

DEVELOPMENT OF FIPR-FUNDED PROJECTS

Institute-funded projects are directed at solving real problems identified with the mining and processing of phosphate rock in Florida, in which the public has a substantial interest. Projects originate from one or more of the following sources:

1. Unsolicited proposals from the technical community and researchers that address the objectives and priorities of FIPR.
2. Proposals formally solicited by the FIPR Staff from the technical community through "Requests for Proposals" to address unmet research needs.
3. Proposals originating from the FIPR Staff and/or its Technical Advisory Committees.
4. Proposals from governmental agencies including FDEP and EPA.

This document is intended to provide guidance for proposal topic development for all the above sources, but it is specially targeted at the unsolicited proposal process.

The Institute and its reviewers attempt to answer the following three questions when evaluating whether proposals are in the public interest :

1. Is it technically feasible?
2. Is it beneficial, or at least neutral, to the environment and public health?
3. Is it economically practical?

Florida Institute of Phosphate Research

1998-2003

Strategic Research Priorities

Environmental Research Priorities

I. Environment

Objective

Through 2002, evaluate the effects of phosphate industry activities on the environment and develop improved methods for minimizing negative impacts and for restoring ecological (terrestrial and aquatic) and hydrologic systems.

Approach 1. Evaluate the impacts of phosphate mining, processing, and amelioration practices (including reclamation and pollution control) on the environment.

Approach 2. Further develop mapping, modeling and related visualization tools and databases to assist in the evaluation and implementation of ecological and hydrological system restoration.

Approach 3. Further develop techniques for reclaiming and restoring mined lands to improve their functioning and to facilitate their integration into larger landscapes and ecosystems, including habitat networks and greenways.

Approach 4. Further develop and evaluate methods to facilitate hydrologic restoration of streams, to improve groundwater recharge; and to enhance the quantity and quality of the water supply for human and ecological needs.

Approach 5. Further develop and refine hydrologic models.

Approach 6. Further develop techniques for assessing and reducing the impacts of mining and processing on local and regional surface and groundwater resources and systems.

II. Reclamation/Restoration

Objective

Through 2002, continue the development of technology for restoring ecological and hydrological systems and for reclaiming mining and processing disturbances or wastes to a more environmentally desirable and useful condition.

Approach 1. Further develop techniques and recommendations for reducing mining impacts and for reclaiming and restoring critical habitats and ecological systems, including wetlands, streams, lakes, xeric uplands, flatwoods, etc.

Approach 2. Further develop meaningful and measurable criteria for assessing restoration success.

Approach 3. Further develop seed sources and methods of establishment for important native plant species.

Approach 4. Further develop appropriate techniques for post-planting vegetation management on uplands and wetlands, including weed control.

Approach 5. Document the ecological characteristics, including wildlife populations and habitat utilization and fragmentation, on unmined versus mined and reclaimed lands, and develop techniques and recommendations for habitat restoration and reintroduction of important species.

Approach 6. Further develop techniques and recommendations for designing, constructing and managing mine pit lakes to enhance their ecological and recreational values.

Approach 7. Investigate ways to improve soil conditions on reclaimed lands, including reducing compaction and optimizing nutrient and moisture conditions.

Approach 8. Further develop economical techniques and recommendations for closing phosphogypsum stacks and minimizing hydrologic and water quality impacts on their surroundings.

Approach 9. Further develop techniques and recommendations for reclaiming clay settling areas that will enhance their hydrologic functioning and increase their usefulness for wildlife habitat, forests, wetlands, agriculture, etc.

III. Public Health

Objective

By 2002, define the magnitude of public and occupational health aspects of radiation, hazardous or toxic materials, and air and water pollutants.

Approach No. 1. Conduct and sponsor studies of chemical and radiological contaminants in air, water, and soil to determine if there are significant risks to public health for persons residing in phosphate regions.

Approach No. 2. Continue studies to determine if there are significant occupational-related risks to the health or safety of persons employed within the phosphate industry.

Approach No. 3. Conduct educational programs to inform the public about radiation and other environmental issues related to public health concerns.

Technology

IV. Phosphogypsum and Process Water

Objective 1

Through 2002, further develop technology that will allow a reduction in the rate of accumulation of phosphogypsum per ton of phosphoric acid by 15%, adjusted to account for declining matrix grade.

Approach No. 1. Produce phosphogypsum that can be widely used for construction and agriculture in a way that minimizes environmental impacts.

Approach No. 2. Further develop and demonstrate environmentally acceptable uses for phosphogypsum.

Approach No. 3. Further develop factual information on actual risks and economic benefits of various uses of phosphogypsum.

Approach No. 4. Provide scientific support and information to FDEP, US EPA and other interested parties that can be used in their regulations and rules that impact the use of phosphogypsum.

Approach No. 5. Further develop viable alternative phosphoric acid manufacturing technologies to reduce (or eliminate) the production of phosphogypsum.

Objective 2

Through 2002, further develop technology to raise the pH of phosphoric acid process

water (pond water) to 2 or above, thus precluding future regulation under RCRA Subtitle C.

Approach No. 1. Reduce fluoride in the process water by recovering the fluoride and using it for salable products.

Approach No. 2. Improve the efficiency of the phosphoric acid process to reduce the amount of acid that ends up in the process water.

Approach No. 3. Partially neutralize the process water while still recovering the phosphate.

V. Mining and Rock Processing Efficiency

Objective 1

Through 2002, further develop technology to improve the efficiency of the phosphate industry with respect to one or more of the following: energy use by 10%, flotation chemicals consumption by 15%, or overall recovery (reduce loss) of phosphate mined by 10%, adjusted to account for declining matrix grade, compared to 1996.

Approach No. 1. Develop new, more efficient mining, beneficiation, processing and transportation methods.

Approach No. 2. Continue the development of an economically viable process for removing dolomite from the feed to the phosphoric acid plant.

Approach No. 3. Further develop techniques to improve phosphate recovery.

Approach No. 4. Develop, install and utilize computer process control and instantaneous analysis in an operating plant.

Approach No. 5. Improve chemical utilization in the conditioning step of phosphate flotation and the defoaming step at processing plants.

Objective 2

Through 2002, further develop technology to reduce deep well water consumption per ton of phosphate rock.

Approach No. 1. Improve amine flotation when using recycled water.

Approach No. 2. Recover more of the water held in phosphatic clays.

VI. Waste Clay Ponds

Objective

Through 2000, further develop economical processes for consolidating phosphatic clays that will reduce the need to construct new waste clay ponds.

Approach No. 1. Continue the development of rapid clay consolidation techniques to release water more quickly for recycling.

Approach No. 2. Continue the development of acceptable uses for phosphatic clays.

Approach No. 3. Continue the development of techniques to maximize the storage capacity of waste clay ponds.

Approach No. 4. Continue the development of technology that would eliminate, or reduce the size of, waste clay ponds.

Florida Institute of Phosphate Research

FIPR

1998-2003

Programmatic Priority Issues

Programmatic Priority Issues

I. Public Information

Objective

Through January 1, 1999, further develop a public information program that continues to provide the public with current information on phosphate technology and issues.

Approach 1. Further develop a Public Information Program that links FIPR's public education, library and information management priorities with technology initiatives.

Approach 2. Continue to improve the FIPR home page on the Internet.

Approach 3. Develop and implement an interactive "Phosphate Forum" on the Internet on phosphate technology and issues. Link to related public education, library and information management initiatives.

Approach 4. Establish and maintain close contacts with media personnel. Develop and publish research reports or news releases that provide current information on phosphate technology and issues that can be used by the news media. Use this reporting process as part of the framework for developing the FIPR Annual Report.

Approach 5. Develop information on implementing phosphate technology

II. Public Education

Objective

Through July 1, 1999, further develop programs to educate the public about phosphate technology and environmental issues.

Stakeholder A - Educators and Children in grades K through 12.

Approach 1. Further develop a FIPR public education program to include at a minimum:

- Cooperation with the Department of Education and School Boards and other interested agents and parties.
- Methods, materials, and curricula that can assist schools in meeting Sunshine State Standards.

- Cooperation with the School Boards, Superintendents, and Principals to:

    1. Place FIPR and phosphate-related materials in school libraries.

    2. Conduct a series of training workshops (including field trips) for teachers using FIPR-provided materials and curricula.

    3. Establish a program to provide students with awareness and hands-on participation with phosphate technology, issues, solutions, research and monitoring.

Approach 2. Develop and publish a public education curriculum brief to be available and accessible within the school systems.

Stakeholder B - General Public.

Approach 1. Work with the media, public service agencies, civic clubs, business groups, chamber of commerce and related local institutions to provide updated information on phosphate issues.

Approach 2. Further develop a FIPR public education program to include at minimum:

1. Facilitating public field trips to demonstrate phosphate technology, uses, and effects, land reclamation and wildlife management.
2. Further developing brochures and videos designed for the public.
3. Placing a collection of materials in local libraries and libraries throughout the state..

Stakeholder C - Legislators and Local and State Government Officials.

Approach 1. Conduct a forum, at least once a year, on a phosphate issue selected by the Board to improve understanding of phosphate issues for selected state and local elected officials and top government appointees

Approach 2. Establish regular meetings, at least semi-annually, with local commissioners and managers as well as local legislative delegations and their respective aides.

Approach 3. Have information in-house and mail (on a regular basis) to a broad mailing list of local and state elected and appointed officials.

Stakeholder D - Phosphate Industry Management and Environmental Groups.

Approach. Have periodic meetings with phosphate industry managers and environmental groups to provide information about FIPR's programs and research results.

Stakeholder E - Higher Education Institutions (including Community Colleges), College students, Teachers, and Researchers.

Approach 1. Conduct a series of training workshops (including field trips) for teachers using FIPR provided materials and curricula. (cf. Stakeholder A).

Approach 2. Develop materials for possible incorporation into curricula of Community Colleges and Higher Education Institutions.

Approach 3. Conduct workshops and symposia concerning phosphate issues for faculty and students.

III. Library and Information Management

Objective

Through July 1, 1999, continue working to attain, a 10% increase (above baseline levels to be established in FY 96/97) in the usage of the Institute's library as a national repository and provider of scientific/technical research information on phosphate technology and issues.

Approach 1. Further develop and implement a Library Acquisition and Collection Development Plan to include accompanying policies, procedures, and budget.

Approach 2. Continue the development of an internal electronic network for sharing documents for printing and E-mail.

IV. Technology Transfer

Objective

Through January 1, 1999, further develop and enhance the technology transfer program to ensure that users of FIPR research results are aware of FIPR' s research and have ready access to the results of research in a form which facilitates its uses.

Approach 1. Continue to provide, through the use of an electronic network, FIPR and industry information for release, access and future decision making.

Approach 2. Continue to provide information on FIPR research through the public education, library and information management, and public information programs.

Approach 3. Further develop and publish research results on various technologies.

Approach 4. Continue to conduct demonstration projects to show the feasibility and practicality of FIPR research.

Approach 5. Continue to provide technical support, through FIPR staff and its contractors, to users of FIPR research and technologies.

Approach 6. Continue to conduct and sponsor workshops and conferences.

Florida Institute of Phosphate Research

1997-1999

Management Priority Issues

Management Priority Issues

I. Administration

Objective

By January 1, 1999, analyze and change selected administrative and business processes to be at least 10% more cost effective than the FY 96/97 baseline.

Approach 1. Further develop an action plan for examining FIPR's internal administrative and business processes, e.g., personnel, purchasing, budget process with the University of South Florida.

Approach 2. Continue to integrate performance standards and measures into FIPR's administrative, business, and research processes upon completion of the examination.

Approach 3. Continue to examine the Policy Advisory Committee inputs for integration into the

Strategic Plan.

II. Personnel

Objective

By July 1, 1999, have fully operational the six primary processes of staffing patterns, recruitment, selection, orientation, training, and evaluation.

Approach 1. Further develop operational matrices to provide the framework for the staff to have clarity, accountability and functionality as it relates to the primary approaches in the FIPR Strategic Plan.

Approach 2. Continue to provide additional public speaking training for research directors and other selected staff members.

III. Research Program Administration

Objective

By July 1, 1999, have in operation a contract research management methodology to ensure that research is performed to achieve strategic initiatives, research objectives, and that work is performed on time and within budget.

Approach 1. Continue to refine the Contract Management Policy and Procedure Guide for the solicitation, evaluation, monitoring, evaluation and measurement of research projects.

Approach 2. Continue to refine the procedure for soliciting specific project proposals.

Approach 3. Continue to refine internal laboratory standard operating procedures and quality assurance manuals.

IV. Budgeting and Planning

Objective

By July 1, 1999, have in place a performance-based program budgeting system that measures the essential elements of the strategic plan and work being performed in order to substantiate and improve the funding base for the Institute's research and administrative efforts as a substantive accountability product to the citizens of Florida.

Approach 1. Form a performance-based program budgeting team.

Approach 2. Further develop and implement an action plan for integrating performance based program budgeting.

Approach 3. Further develop baseline data on measures, outcomes and outputs by program area.

Approach 4. Integrate outcome and output measures into the FIPR substantive research, programmatic, and management priorities.

Approach 5. Integrate performance-based program budgeting into the Legislative Budget Request (LBR) and strategic planning process.

Approach 6. Continue to reexamine the research strategic initiatives during Calendar Year (CY) 1998 and subsequent years, using inputs from the industry, environmental groups, governmental agencies, educational institutions, regulators and the public.

V. Facilities

Objective

By January 1, 1999, the Institute's physical plant, as well as capital and expendable equipment will be adequate to support 100% of the Institute activities.

Approach 1. Continue the development of a Facilities and Equipment Improvement Plan.

Approach 2. Continue to link this program with the Institute's Safety Plan and personnel requirements.

VI. Safety

Objective

The Institute's offices, laboratories, and field activities are to be in 100% compliance with accepted safety standards, and personnel will have received at least 12 hours of annual safety training in areas such as cardiopulmonary resuscitation (CPR), first aid, and emergency evacuation.

Approach 1. Coordinate the administration of an Institute safety audit by the Environmental Health and Safety Office of the University of South Florida.

Approach 2. Continue to monitor safety and upgrade the quality of the facilities at the Institute.

Approach 3. Further develop and improve laboratory, field, and office safety plans to include, as a minimum, safety procedures, training (e.g., CPR, first aid), remote communications with the field, emergency telephone numbers, emergency vehicles in the area of the Institute.

GLOSSARY OF TERMS

Amine: An organic compound (a cationic surfactant) that adheres on the surfaces of sands to achieve separation of phosphate from sands in phosphate flotation.

Beneficiation: In the case of Florida phosphate, this refers to the washing and flotation processes that separate sand and clay from sand-sized phosphate rock.

Clay settling areas/ponds: Usually above-grade, diked reservoirs for containing and dewatering of fine clay particles which result from the washing/sizing of phosphate matrix.

Clay consolidation: Increasing clay solid content by gravity settling and dewatering.

Column (flotation): A tall, small-diameter cylindrical tank used for floating minerals and typically having rapid liquid flow and very small bubbles.

Computer process control: A feedback, self-correcting process control system for optimizing the efficiency of a chemical or physical process.

Conditioning step: The process step in which the fine particles of phosphate and sand are treated with a chemical reagent to render them separable by a subsequent flotation step.

Critical natural habitats: Lands with ecological attributes (including adequate size, hydrology, cover, food sources, etc.) essential for supporting various native animal populations.

Dolomite: A naturally-occurring mineral composed of calcium and magnesium carbonates ($CaCO_3$-$MgCO_3$).

Ecological systems (ecosystems): Units of nature in which living organisms interact with their environment and which display characteristic structures and functional relationships.

Fatty Acid: An organic compound (an anionic surfactant) that adheres on the surfaces of phosphate to achieve separation of phosphate from sands in phosphate flotation.

Flotation process/flotation chemicals: The process for separating the sand from phosphatic rock in which the components are treated with chemicals to make the particles attach to air bubbles and rise to

the surface of a turbulent water system where they can be skimmed off.

Fluoride: Any inorganic salt of the element fluorine.

Hazardous/non-hazardous materials: Chemical substances that have been classified as toxic to humans or damaging to the environment by a Federal or State agency/or alternatively, which have been classified as benign, based largely on the amount present.

Hydrology: The study of water in the environment.

Hydrology Model: A mathematical simulation of the hydrology of a given area

"Instantaneous" analysis: An analytical procedure that presents the results quickly, usually within several minutes of sampling.

Land dredge: A dredging machine, operating on dry land, capable of recovering a slurry of solids from a pit or recessed area.

Matrix: Mixture of sand, clay and phosphate rock that is mined in Florida

NORM: Naturally occurring radioactive material.

Peer review: The process of having other recognized experts in a given field objectively assess and comment on a research proposal or report.

pH: A measure of the acidity or basicity of a given material. Technically, the negative logarithm (base 10) of the hydrogen ion concentration. A pH of 7 is neutral; >7 is basic; <7 is acidic.

Phosphatic clays: The finely divided mineral fraction (-150 mesh or < 10 micron) of phosphate matrix composed of a suite of common clay minerals (smectite, montmorillonite, kaolinite, etc.) plus dolomite, quartz and apatite impurities.

Phosphogypsum: The by-product of treating phosphate rock with sulfuric acid; chemically, hydrated calcium sulfate, the dihydrate being the more common form in Florida. It also contains phosphate, fluorides, trace amounts of metals, including radium, and normally has a low (acidic) pH. It is referred to in Florida simply as gypsum.

Phosphogypsum stacks: Large aboveground piles (up to 200 feet high) of by-product phosphogypsum located near phosphoric acid plants. The gypsum slurry is hydraulically pumped to the top of the stack where it settles out and the slurry water returns to the plant as part of the system to cool process water. As the stack fills with deposited gypsum, the solids are scooped out to build up the sides, and the stack grows in height as the process is repeated.

Phosphoric acid: The chemical compound, H_3PO_4, produced in Florida as an impure aqueous solution by reacting phosphate rock with sulfuric acid.

Process water: Acidic process water is used to slurry and transport to the stack the phosphogypsum formed by reacting phosphate rock and sulfuric acid. The phosphogypsum is allowed to settle out and the process water is returned to the chemical plant. It also refers to the water cooled in diked reservoirs

before being returned to the plant. It is also known as process cooling water or pond water.

Radiation: Energy released by the disintegration (decay) of unstable isotopes. It can be in the form of gamma rays or alpha or beta particles. The radiation referred to in this document results from the decay of natural uranium and its radioactive decay products.

Reclamation: The process of rehabilitating lands disturbed by mining so that they serve a desirable and useful purpose again.

Resource utilization: Efficient recovery and use of natural resources, such as minerals, water supplies and energy.

Restoration: Rehabilitating disturbed land to the condition and function it had before being disturbed and other disturbed land to the condition and function it had before being mined.

Risk assessment: The process of statistically estimating the risk to human health posed by hazards such as radiation, air pollutants, or toxic substances released into the environment.

Slurry: A semi-fluid mixture of (usually) water and finely divided, relatively insoluble solid particles such as clays, phosphogypsum or sand.

Stakeholder: Any person, group or organization that can place a claim on an organization's attention, resources or output or is affected by that output. Examples of stakeholders include citizens, taxpayers, the phosphate industry, service recipients, the Legislature, employees, unions, public interest groups, the financial community, the business community and governmental agencies.

Tailings: The remaining materials of a mineral mixture from which most of the desirable component has been taken out.

Wetlands: Wetlands are lands that have soils saturated with water for a portion of the year and which support specific flora and fauna dependent on such hydrology or moisture conditions.

Xeric uplands: Well-drained, somewhat elevated lands, usually sandy, which support flora and fauna particularly adapted to arid conditions.

LEGISLATIVE LANGUAGE CREATING FIPR

378.101 Florida Institute of Phosphate Research. --

(1) There is created a Florida Institute of Phosphate Research, which is empowered:

(a) To conduct or cause to be conducted such environmental studies related to radiation and water consumption, or other environmental effects of phosphate mining and reclamation, as may from time to time be deemed reasonably necessary by the institute for the health, safety, and welfare of the citizens of this state and particularly the citizens of the regions where phosphate mining or processing occurs.

(b) To conduct or cause to be conducted a thorough and comprehensive study of reclamation alternatives and technologies in the phosphate mining or processing industry, including wetlands reclamation.

(c) To conduct or cause to be conducted a thorough and comprehensive study of phosphatic clay disposal and utilization as a part of phosphate mining, together with all environmental or land use related thereto.

(d) To establish methods for better and more efficient phosphate recovery mining and processing in this state as it may determine most beneficial to the economy, environment, and way of life of the citizens of the state.

(e) To enter into any mutually satisfactory contract with any firm, institution, corporation, or federal or state agency, as may be reasonably required or desired in carrying out the research and studies herein authorized.

(f) To make available to the public the results of its research program so that the research efforts will result in the public's being better informed as to the effects of phosphate mining in the state.

(g) To hold public hearings and consult with representatives of the phosphate industry and all other interested parties; to assign priorities for its research and studies; to make public from time to time its intentions as to future research and study; and to allocate its resources and personnel for such research and studies as it may determine from time to time to be in the public interest.

(h) To provide suitable and sufficient laboratory facilities and equipment, making use insofar as practical of the existing laboratory facilities and equipment of the State University System and other facilities as may be available, for carrying out the research and studies herein authorized.

(i) To administer the Phosphate Research Trust Fund and to expend funds therefrom for its administration and for carrying out the purposes set forth in this section. The Phosphate Research Trust Fund shall be subject to the service charge imposed pursuant to chapter 215.

(2) The institute may develop work products relating to research which is subject to trademark, copyright, or patent protection. Notwithstanding any law to the contrary, the institute may:

(a) Secure patents, copyrights, or trademarks on any of its work products and enforce its rights in such products. It shall consider contributions by Institute personnel, contractors, and grantees in the development of such products and shall enter in to written agreements with them establishing the interests of the respective parties in each patent, copyright, or trademark it secures.

(b) License, lease, or assign, or otherwise give consent to other persons for the manufacture or use of, work products it develops and receive royalties or other consideration for such use.

(c) Take any action necessary to protect its work products from improper or unlawful use of infringement.

(d) Collect any sums due it for the manufacture or use by any other person of such work products.

(e) Sell its interest in or rights to any work products it owns.

(f) Do all acts necessary to exercise its powers and perform its duties. Any action taken by the institute in securing or exploiting such patents, copyrights, or trademarks shall, within 30 days, be reported in writing to the Department of State. Any proceeds received by the institute under this subsection shall be deposited in the Phosphate Research Trust Fund for use as provided by law.

(3)(a) The institute may establish policies necessary to administer its research programs to assure their efficiency and effectiveness, producing the maximum benefit to the economy, environment, and residents of this state.

(b) Materials which relate to methods of manufacture or production, actual or potential trade secrets, patentable or potentially patentable materials, business transactions, or proprietary information pertaining to research conducted by or on behalf of the institute shall be confidential and exempt from the provisions of s. 110.07(1), except that the institute shall disclose upon request, the title and description of any research project, the researchers' names, and the amount and source of funding provided for such project. This exemption is subject to the Open Government Sunset Review Act in accordance with s. 119.14.

(4)(a) The work of the Florida Institute of Phosphate Research shall be directed by a five-member board of directors appointed by the Governor. The board shall be composed of one member from the faculty of a university within the State University System, one member from a major conservation group in this state, one member from state government, and two members from the phosphate mining or processing industry. The Governor shall make these appointments on the basis of their ability to set priorities for the phosphate research and otherwise give direction to a professional, efficient, and broad phosphate research effort. In setting such

priorities, emphasis shall be given to applied research which tends to solve real problems of the industry in which the public has a substantial interest.

Members of the board of directors shall serve 3-year terms, or serve until successors are appointed; except that, of those members first appointed following October 1, 1983, one member shall be appointed for a term of 1 year; two members shall be appointed for terms of 2 years; and two members shall be appointed for terms of 3 years in order to achieve staggering of terms. A member of the board of directors shall be eligible for reappointment.

(c) A vacancy occurring other than by expiration of a term shall be filled by appropriate appointment for the remainder of the unexpired term in the same manner as the original appointment. However, no single vacancy in the board of directors shall impair the right of the remaining members to exercise the powers of the board of directors.

(d) The members of the board of directors shall select a chairman.

(e) The policies and decisions of the board shall be implemented through an executive director chosen by the board on the basis of professional competence, both scientific and administrative.

(f) The board shall adopt rules necessary to carry out the duties and responsibilities of the institute.

378.102 Florida Institute of Phosphate Research;

procurement of research services.--

(1) SHORT TITLE.--This section may be cited as the "Florida Institute of Phosphate Research Competitive Negotiation Act."

(2) DEFINITIONS.--As used in this section, the term:

(a) "Research services" means services within the scope of research, as performed by a chemist, biologist, geologist, engineer, university professor, or other researcher in connection with research performed for the institute.

(b) "Institute" means the Florida Institute of Phosphate Research.

(c) "Firm" means any individual, firm, partnership, corporation, association, university, state or federal agency, or other legal entity permitted by law to enter into a contractual agreement for services in this state.

(d) "Compensation" means the total amount paid by the institute for research services.

(e) "Project" means the research study or planning activity described by the institute pursuant to paragraph (3)(a)

(f) "Selection committee" means a group composed of one or more of research directors of the institute and one or more outside experts, knowledgeable in the research subject to be addressed in the project. The committee shall consist of an odd number of at least three members selected by the board of directors of the institute.

(3) PUBLIC ADVERTISEMENT AND QUALIFICATION

PROCEDURE.--

(a) The institute shall publicly advertise, in a uniform and consistent manner, each occasion when research services are required to be purchased for a research project or for a research-related planning or study activity and the fee for services exceeds $5,000. The advertisement shall include a general description of the project and shall indicate how interested parties may apply for consideration.

(b) The institute shall adopt administrative procedures for the evaluation of research services, including, but not limited to, qualifications of the firm, capabilities, adequacy of personnel, plan of study, past record and experience, and any other factors applicable to the institute's requirements for a project.

(c) The proceedings under this section shall be open to the public.

(4) COMPETITIVE SELECTION.--

(a) A selection committee shall be chosen to evaluate current statements of qualifications and performance data on file with the institute, for each proposed project, with statements submitted by other firms regarding the proposed project, and shall conduct discussions with, and may require public presentations by, no fewer than three firms regarding their qualifications, approach to the project, and ability to furnish the required service. If three firms are not available, the board of directors may authorize consideration of fewer than three firms.

(b) The selection committee, considering the ability of research personnel; past performance; proposed plan of study; willingness to meet time and budget requirements; location; recent, current, and projected workloads; and the volume of work previously awarded to the firm by the institute, shall select in order of preference no fewer than three firms deemed to be most highly qualified to equitably distribute contracts among qualified firms, provided the most highly qualified firm with the most appropriate plan of study is selected. If fewer than three firms apply, the board of directors may consider the ones that apply.

(c) This subsection does not apply when the fee for professional services is $5,000 or less.

(5) COMPETITIVE NEGOTIATION.--

(a) The institute shall negotiate a contract with the selected firm at compensation which is fair, competitive, and reasonable. In making such determination, the institute shall analyze the cost, scope, and complexity of the research services required. Fixed-fee contracts must contain a provision stating that wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time of contracting and must contain a provision that the original contract price and any additions will be adjusted to exclude any significant sums by which the institute determines the contract price was increased due to inaccurate, incomplete, or noncurrent wage rates and other factual unit costs. Contract adjustments must be made within 1 year following completion of a contract.

(b) If the institute is unable to negotiate a fair, competitive, and reasonable contract with the most qualified firm, negotiations with that firm shall be terminated and the institute shall negotiate with the second most qualified firm. If no agreement can be reached with the second most qualified firm, the institute shall terminate negotiations and shall negotiate with the third most qualified firm.

(c) If the institute is unable to negotiate a satisfactory contract with any of the selected firms, the institute shall select additional firms in order of competence and qualifications and shall continue negotiations until an agreement is reached, or the institute may readvertise or terminate the project.

(6) PROHIBITION AGAINST CONTINGENT FEES.--

(a) Each contract entered into by the institute for research services must contain the following provision: The researcher warrants that he has not employed or retained any person, other than an employee working only for him to secure this agreement and that he has not paid or agreed to pay any other person any consideration contingent upon the making of this agreement. If this provision is violated, the institute may terminate the agreement without liability and may deduct from the contract price, or otherwise recover, the full amount of such consideration from the researcher.

(b) Any person, other than an employee working only for a researcher, who offers, agrees, or contracts to solicit or secure institute contracts for any person other than the researcher and is to be paid, or is paid, any consideration contingent upon the award of a contract, is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.

(c) Any person who offers to pay or pays any consideration contingent upon the award of any contract is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.

(d) Any person employed by the institute who offers to solicit or solicits a contract for consideration contingent upon the award of such contract is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.

(7) APPLICABILITY TO EXISTING CONTRACTS.-- This section does not affect the validity or effect of any contracts in existence on October 1, 1986.

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Last Updated: July 10, 1998

CHAPTER 62C-35
CERTIFICATION TO ADMINISTER RECLAMATION RULES

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62C-35.002 Definitions. (REPEALED)
Specific Authority 370.021, 378.404, 378.411 FS. Law Implemented 378.403, 378.411 FS. History--New 2-22-87, Amended 11-29-90, Formerly 16C-35.002, Repealed 10-20-96.

62C-35.003 Petition for Certification.

(1) A local government or the Florida Department of Transportation may petition the executive director to receive notices of intent to mine and other documents required to carry out chapters 62C-36 and 62C-39, F.A.C.; to review such notices and documents; and to conduct compliance inspections.

(2) The petition shall be in writing, filed with the department, and include, at a minimum, the following information:

(a) A statement that the agency is petitioning for certification to administer state reclamation requirements and whether the agency is petitioning for certification in whole or in part. If in part, the limits of certification shall be clearly defined.

(b) The name, address, and phone number of the petitioning agency, including the name of the section, division, department, office, or subgroup of the agency that will be responsible for receiving notices, reviewing such notices, and conducting compliance inspections.

(c) The name, title, address, and phone number of the person within the petitioning agency who will have the responsibility for administering the activities granted by the certification.

(d) The signature and title of the person authorizing the agency to petition for certification.

(3) Within 30 days of receipt of the petition, the department shall request any additional information needed to evaluate the petition.

(4) The department shall place a notice in a newspaper of general circulation in the petitioner's area within 30 days of receipt of the petition. The notice shall state that such a petition has been filed with the bureau and provide an address to which comments can be sent.

(5) In deciding whether or not to grant certification to a local government, the department shall determine whether the following criteria are being met:

(a) The petitioning local government has adopted and effectively implemented a local government comprehensive plan.

(b) The local government has adequate review procedures and the financial and staffing resources necessary to assume responsibility for adequate review and

inspection.

(c) The local government has a record of effectively reviewing, inspecting, and enforcing compliance with local ordinances and state laws.

(6) In making his determination, the executive director shall consult with the Department of Community Affairs, the Department of Environmental Protection, the appropriate regional planning council, and the appropriate water management district.

(7) The executive director shall grant, grant with modifications, or deny certification, as requested by the petitioner, in whole or in part, within 90 days of receipt of the original petition or the requested additional information. The executive director shall deny a petition without prejudice, if requested additional information is not received within 60 days of the receipt of a request for additional information by the petitioner.

(8) The department shall specify an effective date different from the date of approval to allow the certified agency time to adopt any appropriate ordinances or rules necessary to carry out the specific requirements of certification.

(9) Requests by a certified agency to modify its certification shall be submitted and reviewed in the same manner as an original petition.

(10) The department may review certification at any time, but shall review certification at least once every five years.

Specific Authority 370.021, 378.404, 378.411 FS. Law Implemented 378.411 FS. History--New 2-22-87, Amended 11-29-90, Formerly 16C-35.003.

62C-35.004 Responsibilities of Certification.

(1) After becoming certified, the certified agency shall carry out its responsibilities under chapter 62C-35, F.A.C., and the regulatory responsibilities of Chapters 62C-36 and 62C-39, F.A.C., as granted by the department.

(2) Certification shall not preempt the right of the department to carry out inspections pursuant to section 378.407, Florida Statutes.

(3) A certified agency shall notify the department at least 30 days prior to taking enforcement action against any operator.

(4) The department shall have the right to inspect those files of the certified agency that pertain to the responsibilities of certification.

(5) The department retains the right to seek injunctive relief against any operator, whether or not such operator is regulated by a certified agency.

Specific Authority 370.021, 378.404, 378.411 FS. Law Implemented 120.69, 378.411 FS. History--New 2-22-87, Amended 11-29-90, Formerly 16C-35.004.

62C-35.005 Suspension and Revocation of Certification.

(1) The certified agency may suspend its involvement in certification at any time with 60 days notice in writing to the department.

(2) If the department determines that the certified agency has failed to perform

its responsibilities, as certified, the department shall revoke the certification in whole or in part with 60 days notice in writing to the certified agency.

(3) If certification is suspended or completely or partially revoked, the department shall require that the certified agency turn over to the department all related notices and documents obtained as a result of the certification.

Specific Authority 370.021, 378.404, 378.411 FS. Law Implemented 378.411 FS. History--New 2-22-87, Amended 11-29-90, Formerly 16C-35.005.

62C-35.006 Annual Reports.

(1) Each certified agency shall submit an annual report to the department that summarizes the reclamation regulation activities for which it has been certified. The report shall cover all activities for the preceding calendar year and shall be submitted no later than May 1 of each year.

(2) If certification occurs after November 30th, the first annual report shall not be due until May 1 of the second calendar year following certification, but shall include activities from the date of certification through the end of the first full calendar year.

(3) The annual report required pursuant to this section shall include at least the following information:

(a) A list of all new notices received, identifying the type of notice, the date received, the mine, and the operator.

(b) A list of all notices determined sufficient, identifying the type of notice, the date determined sufficient, the mine, and the operator.

(c) The number of citations issued for noncompliance.

(d) The number of acres in mining operations, under reclamation, and released.

(e) A list of operators that have not submitted an annual report as of the date the certified agency submitted its report to the bureau.

(f) Any change in the information submitted in the petition for certification or changes identified in previous annual reports.

(g) The first annual report shall include an inventory of all mines within the certified agency's jurisdiction that have been operating within the last five years. Each annual report thereafter shall provide only additions or deletions to the initial inventory. The inventory shall include the following information for each mine:

1. Name of mine.
2. Operator's name, address, and phone number.
3. Acreage.
4. Resource extracted.

(h) Each annual report shall include a list of mines that are expected to open within the next two years and should provide the information requested under paragraph (g) above to the extent known.

(4) After examining each annual report, the department may notify the certified agency of any apparent errors or omissions or request a clarification of any information

contained in the report. The certified agency shall respond within 60 days of receipt of such notification or request.
Specific Authority 370.021, 378.404, 378.411 FS. Law Implemented 378.411 FS.
History--New 2-22-87, Amended 11-29-90, Formerly 16C-35.006.

CHAPTER 62C-36
LIMESTONE RECLAMATION REQUIREMENTS

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62C-36.001 Intent and Applicability. (REPEALED)
Specific Authority 370.021, 378.404 FS. Law Implemented 378.404, 378.412 FS. History--New 7-16-87, Formerly 16C-36.001, Repealed 10-20-96.

62C-36.002 Definitions.

For the purpose of this chapter, the following words and terms shall have the definitions and meanings ascribed to them in this section:

(1) "Agency" means an official, committee, department, commission, officer, division, authority, bureau, council, board, section, or unit of government within the state, including a county, municipality, or other local or regional entity or special district.

(2) "Bureau" means the Bureau of Mine Reclamation, 903 West Tennessee Street, Tallahassee, Florida 32304.

(3) "Certified" means approved by the executive director to administer the requirements of this chapter. This term shall only apply to the Department of Transportation or a local government.

(4) "Conceptual plan" means a generalized graphic and written description of mining and reclamation activities.

(5) "Department" means the Governor and Cabinet, sitting as the head of the Department of Environmental Protection.

(6) "Executive director" means the chief administrative officer of the department or his designee.

(7) "Existing mine" means any mine upon which an operation is being conducted, or has been conducted, on October 1, 1986.

(8) "Extraction" means the removal of limestone from its location, so as to make it suitable for commercial, industrial, or construction use; but does not include excavation solely in aid of on-site farming or on-site construction, nor the process of searching, prospecting, exploring, or investigating for limestone by drilling.

(9) "Limestone" means any extracted material composed principally of calcium or magnesium carbonate. This includes coquina and shell.

(10) "Local government" means any county or municipality.

(11) "Mine" means an area of land upon which mining operations have been conducted, are being conducted, or are planned to be conducted, as the term is commonly used in the trade.

(12) "New mine" means any mine that is not an existing mine.

(13) "New surface area" means any area at an existing mine which is initially disturbed by mining operations after January 1, 1989, or where removal of undisturbed overburden begins after January 1, 1989.

(14) "On-site" means within the contiguous limits of an area of land under one ownership or control and upon which farming or construction activities are taking place. Areas of land that are divided by public or private roads are considered contiguous if such areas are under one ownership or control.

(15) "Operation" means any activity, other than prospecting, necessary for site preparation, extraction, waste disposal, storage, or reclamation.

(16) "Operator" means any person engaged in an operation.

(17) "Overburden" means soil and rock removed to gain access to the limestone in the process of extraction and means such soil or rock before or after its removal. This does not include tailings or screenings generated by limestone processing.

(18) "Reclamation" means the reasonable rehabilitation of land where limestone extraction has occurred.

(19) "Sheer wall" means any near vertical surface of consolidated limestone that is above the water table and ten feet or more in height.

(20) "Wetlands" means any area having dominant vegetation as defined and listed in Department of Environmental Protection Rule 62-301.400, Florida Administrative Code, regardless of whether the area is within the Department of Environmental Protection's jurisdiction or whether the water bodies are connected. Specific Authority 370.021, 378.404 FS. Law Implemented 378.403, 378.404 FS. History--New 7-16-87, Formerly 16C-36.002.

62C-36.003 Notices, Plans, and Information Required.

(1) New Mines. Operators of new mines shall notify the executive director of their intent to mine or their commencement of mining operations, as follows:

(a) Subsequent to the effective date of this rule, no operator may begin the process of extraction at a new mine without notifying the executive director of the intent to mine at least 60 days prior to the beginning of mining operations. The notice shall include the information required in subsection (3), below.

(b) For those mines where extraction began after January 1, 1987, and on or before the effective date of this rule, notices of intent to mine shall be provided within 60 days of the effective date of this rule. Such notices shall be considered notices of intent to mine even though mining operations have already begun and shall include the information required in subsection (3), below.

(c) For those mines where extraction began after October 1, 1986, and before January 2, 1987, the operator shall provide the executive director with the information required in subsection (3), below, within 60 days of the effective date of this rule.

(2) Existing Mines.

(a) Prior to January 1, 1988, each operator shall provide the executive director a documented list of its existing mines which shall include the operator's name, address, phone number and the name, address, phone number, and plan view of each mine. The plan view shall be a map or good quality aerial photograph facsimile which includes the mine name, mine boundary, north arrow, section-township-range data, marked section corners, scale, date prepared, and date flown, if applicable.

(b) By January 1, 1989, operators of existing mines who intend to disturb new surface areas after January 1, 1989, shall provide a conceptual plan for mining and

reclamation for review in accordance with section 62C-36.006 for the new surface areas to be disturbed. The content of the plan shall be as required in paragraphs (3)(a) and (b), below.

(3) Information Required. In order to clearly identify the operator and the mine location and to evaluate the operator's understanding of and probable compliance with the reclamation performance standards in section 62C-36.008, the executive director must obtain a minimum amount of information for each mine; therefore, the following information shall be provided in whole or in part, as specified in subsections (1) and (2), above:

(a) General information.

1. Operator's name, mailing address, business address, and phone number.

2. Name of parent company, corporation, etc., mailing address, business address, and phone number.

3. Mine name, mailing address, business address, and phone number.

4. Authorized agent's name, mailing address, business address, and phone number.

5. Date mining operations began or are to begin at this mine.

6. Mine location by county, township, range, section, and quarter-section.

(b) Conceptual plan. A conceptual plan for mining and reclamation shall include:

1. Separate maps that show the:

a. Mine boundary on the most recent U.S. Geological Survey, 1:24,000, topographic map or maps of the mine area.

b. Total area to be mined and disturbed. Areas to be disturbed, but not mined, shall be identified separately. This map shall also show the projected sequence of mining. In addition, for existing mines this map shall show areas that have been or will be mined or disturbed before January 1, 1989, and the current status of those areas.

c. Approximate depths to which mining will occur or depth to the water table, if mining will occur below the water table.

d. Estimated postreclamation topography, drainage features, and structures.

e. Planned postreclamation vegetation.

2. Typical cross sections that clearly show the design of reclaimed sheer walls and shore line treatments for water bodies.

3. A general discussion of the mining operations and reclamation activities.

4. An estimated time schedule for reclamation.

5. The estimated life of the mine.

6. A list of approved permits. This shall include copies of any dredge and fill permits approved by the U. S. Army Corps of Engineers or the Florida Department of Environmental Protection, water use or surface water management permits issued for existing and proposed facilities or works, and any permits and reclamation plans approved by the appropriate local government.

7. A list of pending permit applications which are related to reclamation.

8. A list of other permits which are related to reclamation and are known to be required.

9. A copy of the Application for Development Approval and the Development Order, if applicable.

(c) Signed acknowledgment of reclamation performance standards.

(4) Cessation of Operations. An operator shall notify the executive director within at least 30 days after the temporary or permanent cessation of mining at a mine. Notice shall not be required when the temporary cessation period is less than six months.

(5) Conceptual Plan Changes.

(a) An operator shall notify the executive director of the following changes to the conceptual plan prior to implementing such changes. Such changes are changes in the:

1. Originally noticed area to be mined that are greater than 20 percent or 100 acres, whichever is smaller.

2. Reclamation design of sheer walls or shorelines.

3. Elevations of reclaimed uplands that are greater than 10 feet and affect more than 20 percent or 100 acres, whichever is smaller, of the disturbed area.

4. Postreclamation drainage patterns that affect more than 20 percent or 100 acres, whichever is smaller, of the disturbed area.

5. Revegetation plan which affect more than 20 percent or 100 acres, whichever is smaller, of the area to be revegetated.

6. Plans that are not consistent with the reclamation standards in section 62C-36.008.

(b) The notification required in paragraph (a) above shall include the following information:

1. Name of mine.

2. Name of operator.

3. Agency identification code for the plan.

4. A description of the change.

(c) An operator shall notify the executive director of all other changes in a given calendar year to the conceptual plan in the annual report covering that calendar year. Specific Authority 370.021, 378.404, 378.501(3) FS. Law Implemented 378.501, 378.502 FS. History--New 7-16-87, Formerly 16C-36.003.

62C-36.004 Document Format and Standards.

(1) All notices, conceptual plans, conceptual plan changes, and reports shall be submitted using the forms incorporated by reference in section 62C-36.014. Standardized forms are needed to assure that all requests that require agency action are handled in an efficient and expeditious manner. Additional pages needed to complete each form shall conform to the standards in this section. The operator shall submit three copies of each form and its attachments.

(2) All copies of documents shall be of good quality and clearly legible.

(3) At least one copy of all documents that are to be signed shall bear an original signature.

(4) All documents shall be submitted in an 8 1/2- by 11-inch format with a minimum margin of one inch on all sides. Original maps, drawings, and cross sections may be larger than 8 1/2 by 11 inches, but no larger than 30 by 40 inches. Copies of such oversized documents shall be available in both the original scale and the 8 1/2- by 11-inch format.

(5) All maps, drawings, and cross sections shall be of a scale suitable to show the required information. Original map scales shall be no smaller than one inch equals 500 feet, except for the required 1:24,000 topographic maps.

(6) All maps, drawings, and cross sections shall include at least the following information:

(a) Titles that explain their purpose.

(b) Legends that explain all symbols and patterns used.

(c) Scales, where appropriate. Scale bars shall be provided at a minimum.

(d) Location, where appropriate, including sections, townships, ranges, and counties. Maps or plan views shall include at least three fixed points referenced to section corners. When possible these points shall be section corners, but they should not be in a straight line. Cross sections shall have clearly defined end points that shall be located accurately on an inset or other map.

(e) North arrow, where appropriate.

Specific Authority 370.021, 378.404, 378.501(3) FS. Law Implemented 378.404(1), (2), 378.501(3) FS. History--New 7-16-87, Formerly 16C-36.004.

62C-36.005 Notification Procedures.

(1) All operators are encouraged to take part in meetings with the appropriate agencies before doing substantial work on required notices or plans.

(2) All operators shall inform the bureau before submitting a notice of intent to mine or conceptual plan for mining and reclamation. Within seven days, the bureau shall notify the operator of the appropriate agency to which the notice of intent to mine or conceptual plan shall be submitted.

(3) Once the bureau notifies the operator, under subsection (2), above, the operator shall submit all notices, plans, reports, and other required documents to the specified agency, unless the bureau notifies the operator otherwise.

Specific Authority 370.021, 378.404, 378.411(6) FS. Law Implemented 378.411(6) FS. History--New 7-16-87, Formerly 16C-36.005.

62C-36.006 Agency Review Procedures.

All agency reviews shall be conducted as follows:

(1) Within 30 days after receipt of an operator's notice of intent to mine,

conceptual plan, or other notice, the executive director shall review the plan or notice and shall request the submittal of all additional information the agency is permitted by law to require.

(2) The operator shall provide the additional information requested within 45 days of receipt of the request or request an extension to the 45-day period. The extension request shall include the date by which the information can be provided and the reason for the extension. The executive director shall approve reasonable requests that are based on a need to complete data collection.

(3) If the operator believes any agency request for additional information is not authorized by law or agency rule, the operator may request a hearing pursuant to section 120.57, Florida Statutes.

(4) Within 30 days after receipt of the requested additional information, the agency shall review it and may request only such information needed to clarify the received additional information.

(5) If the operator believes the request of the agency for such additional information, requested pursuant to subsection (4), above, is not authorized by law or agency rule, the agency, at the operator's request, shall proceed to process the plan or notice.

(6) The executive director shall notify the operator as to the sufficiency of a notice of intent to mine, conceptual plan, or other notice within 90 days after receipt of the original notice or plan, the last item of timely requested additional information, or the operator's written request to begin processing the notice or plan.

Specific Authority 378.404 FS. Law Implemented 378.404(3), 378.405 FS. History--New 7-16-87, Formerly 16C-36.006.

62C-36.007 Confidentiality and Availability of Records.

(1) All information received by the agency shall be handled, with respect to confidentiality, pursuant to section 378.406, Florida Statutes.

(2) Each original page of all confidential documents shall be stamped by the operator with the word CONFIDENTIAL in bold red letters.

(3) The legal basis for the confidentiality of any information shall be provided as a cover statement for all documents containing confidential information.

(4) All information received from the operator, except as provided in subsection 378.406(1), Florida Statutes, shall be available for public inspection and duplication, pursuant to subsection 378.406(2), Florida Statutes.

(5) Should the executive director determine any alleged confidential information not to be confidential, he shall provide the operator with not less than 30 days' notice of his intent to release the information.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.406 FS. History--New 7-16-87, Formerly 16C-36.007.

62C-36.008 Reclamation Standards.

The following standards shall apply to each entire new mine after October 1, 1986, and to any new surface area disturbed after January 1, 1989, at existing mines.

(1) All reclamation activities shall be initiated at the earliest practicable time.

(a) Where overburden is used to eliminate sheer walls, the placement of overburden against any section of sheer wall shall begin as soon as practical after mining operations are no longer taking place along that section, but no longer than six months after overburden becomes available and mining operations are complete. Contouring of the overburden shall be completed no later than six months after the overburden has been placed.

(b) The requirements in subsections (7) and (8) below for treating final shorelines and sheer walls shall be initiated and completed no later than one year after the calendar year in which the length and final location of shoreline or dry sheer wall was established and other mining operations have ceased in such area. The executive director shall waive this requirement for any reasonable length of time when necessary to prevent unacceptable contamination of the resource being extracted.

(c) Revegetation activities shall be initiated as soon as practical and completed no later than one year after the calendar year in which the final contours are established in an area and revegetation activities would not interfere with mining operations.

(d) Reclamation activities through revegetation shall be completed within three years of the final cessation of mining operations at the mine.

(e) If mining operations temporarily cease at a mine for more than 24 months:

1. The requirements of subsections (7) and (8), below, shall begin immediately and be completed at a rate of at least 1000 feet of shoreline or dry sheer wall per three-month period; or

2. The operator shall post a bond or other surety in an amount reasonably related to the cost of completing reclamation and for the period of time the initiation of reclamation will be delayed, both of which shall be acceptable to the executive director; or

3. The operator shall begin reclaiming an equivalent amount of nonmandatory land at the rate specified in subparagraph 1., above.

4. Compliance with the requirements of subparagraphs 1., 2., and 3., above, shall be tolled by the length of time that a temporary cessation results from attempts to obtain necessary permits for operations.

5. The executive director shall waive the commencement of the requirements in subparagraphs 1., 2., and 3., above, for good cause for the length of time necessary, up to a maximum of one year.

(f) If mining operations cease, for whatever reason, for more than five years at a mine, then all of the requirements of this section shall be met. This period shall be extended for a maximum of five years when the cessation of mining is caused by

governmental action during the review of environmental permit applications. However, the executive director shall direct the operator to complete those reclamation activities necessary to protect the public health and safety.

(g) When mining occurs in layers, then paragraphs (e) and (f), above, shall apply, if mining of the next lower stratum does not begin within five years after the completion of mining of the previous upper stratum. Revegetation of a lower stratum intended for mining shall be delayed, pending the results of a feasibility study on the ability of such a stratum to be revegetated.

(h) The requirements of paragraphs (e), (f), and (g), above, shall be suspended upon the resumption of mining.

(i) The initiation and completion dates shall be determined based on information provided in the annual reports and verified by executive director.

(2) Reclamation activities shall be consistent with all applicable local government ordinances at least as stringent as the criteria and standards contained in this section.

(3) Reclamation shall achieve the stormwater drainage, wetlands, and other surface and groundwater management requirements of the Department of Environmental Protection and the appropriate water management district.

(4) Provisions for safety to persons, wildlife, and adjoining property must be provided.

(a) Site cleanup.

1. All lands shall be reclaimed to a neat, clean condition by removing or adequately burying, where allowed by law, all visible debris, litter, junk, worn-out or unuseable equipment or materials, as well as all poles, pilings, and cables.

2. Large rocks and boulders shall be placed at the base of sheer walls to the extent practical to provide fill for establishing acceptable slopes; otherwise, they shall be placed in common locations at the surface or buried to a minimum depth of four feet.

(b) Structures. All temporary buildings, pipelines, and other man-made structures shall be removed with the exception of those that are of sound construction with potential uses that are compatible with the reclamation goals.

(c) Slopes. The department recognizes that the occurrence of overburden varies widely from mine to mine and that the management of overburden must be based on site-specific plans. Therefore, in addition to providing soil for revegetation purposes, overburden should be utilized to reduce the occurrence of slopes steeper than four horizontal feet for each vertical foot.

(5) The operator shall use the best management practices to minimize erosion.

(a) The use of native topsoils is encouraged, especially in areas reclaimed for aquatic or wildlife habitats.

(b) Where topsoil is not used, the operator shall use a soil or growing medium, including amendments, suitable for the type of vegetative communities planned.

(c) Long, continuous slopes should be avoided.

(d) Mulching, contouring, and other suitable techniques shall be used to enhance stabilization. Should washes or rills develop after revegetation and before final release of the area, the operator shall repair the eroded areas and stabilize the slopes.

(e) A suitable berm or backsloping shall be used along the tops of sheer walls above any required transition benches to prevent uncontrolled surface runoff over the sheer wall.

(6) Reclamation shall include revegetation, with species native to the area, of littoral zones and upland areas, except that revegetation shall not be required in those areas where revegetation is impractical or not in accordance with good land management practices.

(a) The operator shall develop a plan for the proposed revegetation, including the species of grasses, shrubs, trees, and aquatic and wetland vegetation to be planted, the spacing of vegetation, and, where necessary, the program for treating the soils to prepare them for revegetation.

(b) Except as provided below, all upland must have established ground cover for a period of at least one year after planting over 80 percent of the reclaimed upland area, excluding roads, groves, row crops, or any area that qualifies under paragraph (f), below. No bare area shall exceed one-quarter (1/4) acre.

(c) When consistent with proposed land uses, at least 10 percent of the upland and littoral zone areas shall be revegetated as forested areas with a variety of indigenous hardwoods and conifers. An area will be considered to be forested if a stand density of 200 trees per acre is achieved one year after planting. When forestation is not consistent with proposed land uses, one-gallon, containerized trees shall be planted on the upland and littoral zone areas. One containerized tree shall be planted for each acre of upland and littoral zone; however, the density and distribution shall be at the discretion of the operator. This latter requirement shall be met when at least 80 percent of the containerized trees are living one year after planting.

(d) Sheer walls are not subject to the revegetation requirement.

(e) Transition shelves required under paragraph (7)(c), below, shall be revegetated with perennial grasses.

(f) Revegetation shall not be required in those areas where revegetation is impractical or not in accordance with good land management practices. Such areas shall be identified by the operator in the conceptual plan. In addition to identifying these areas, the operator shall provide the basis for considering such areas to be qualified under this paragraph.

(g) Water body shorelines shall be revegetated with a variety of native littoral zone species.

(7) Extraction which results in a water body shall provide one of the following shoreline treatments:

(a) A littoral shelf not less than 18 feet in width with a berm on the waterward

side. The shelf shall not be more than one foot below the design average low water level or higher than one foot below the average water level. The elevation of the top of the berm shall not be higher than one foot above the average high water level and the berm shall be cut every 200 feet to allow exchange of water at low water levels. Such cuts shall be at least 10 feet wide at the top of the berm and at least two feet wide at the base of the berm.

(b) A straight slope not steeper than 1 vertical to 3 horizontal, and extending downward from average water level to 6 feet below the average water level.

(c) Where a sheer wall results, then in lieu of a shoreline treatment, access shall be controlled by the use of berms, fences, or other restrictive methods acceptable to the department, all of which shall be used in conjunction with a transition shelf of at least 10 feet in width that shall be constructed five feet below the top of such sheer walls.

(d) Slope requirements of the U.S. Army Corps of Engineers or the Department of Environmental Protection under the Warren S. Henderson Wetlands Protection Act of 1984 shall be acceptable when permits have been approved and copies have been provided to the executive director.

(e) The executive director shall allow other shoreline treatments that are consistent with the safety and environmental considerations of this rule and shall consult with other appropriate governmental agencies in making his determination.

(8) Where a dry sheer wall results, access shall be controlled by the use of berms, fences, or other restrictive methods, all of which shall be used in conjunction with a transition shelf of at least 10 feet in width that shall be constructed five feet below the top of such sheer walls.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(8), 378.503 FS. History--New 7-16-87, Formerly 16C-36.008.

62C-36.009 Inspections.

(1) Inspections shall be conducted pursuant to section 378.407, Florida Statutes.

(2) If another agency has been certified, pursuant to section 378.411, Florida Statutes, the head of such other agency shall act on behalf of the executive director for the purposes of this section.

(3) Certification, pursuant to section 378.411, Florida Statutes, shall not preempt the right of the department's staff to carry out inspections pursuant to section 378.407, Florida Statutes.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.407 FS. History--New 7-16-87, Formerly 16C-36.009.

62C-36.010 Release Procedures.

(1) Upon completion of reclamation requirements in an area, the operator shall notify the executive director and provide a map which specifically delineates the

completed area.

(2) Within 60 days after receipt of the notification, the executive director shall notify the operator in writing whether or not an inspection will be made within one year after receipt of the operator's notification. The executive director's notification shall include the date the inspection will occur, if an inspection is scheduled.

(3) Within 30 days after the inspection, the executive director shall notify the operator in writing that the area is released or what work must be done before release can be granted.

(4) If the executive director notifies the operator that the area will not be inspected, the area shall be released from reclamation requirements at the end of the second year after receipt of the operator's notification.

(5) If an operator wishes to resume mining operations within a released area, the area to be disturbed shall be considered to be an undisturbed area for the purposes of this chapter and notification shall be made in accordance with the full provisions of this chapter.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(8) FS. History--New 7-16-87, Formerly 16C-36.010.

62C-36.011 Reports.

(1) On or before April 1 of each year, each operator shall submit to the executive director a report for the previous calendar year for each mine under his control. No report shall be required in calendar year 1987; however, any report submitted in calendar year 1988 shall cover the period October 1, 1986, through December 31, 1987. No report shall be required for existing mines until March 1, 1990; this report shall cover the previous calendar year only. Each report shall be submitted on the form incorporated by reference in section 62C-36.014 and shall include the following for the report period:

(a) Name and address of the operator, name of the mine, and year covered by the report.

(b) The number of acres on which extraction occurred during the previous calendar year.

(c) Each area that became available for contouring or revegetation.

(d) The number of acres disturbed, but not mined, and the nature of the disturbances.

(e) The number of acres on which contouring has been completed.

(f) The number of acres on which revegetation has been completed.

(g) A map that illustrates paragraphs (b) through (f), above. To the extent possible, maps submitted with the second and each successive report shall include the information shown on maps submitted with previous reports. The maps may be drawn on plain paper or an aerial photograph facsimile and shall meet the document standards in section 62C-36.004.

(h) A discussion of all changes to the conceptual plan that were not provided in a notice to the executive director.

(2) The bureau shall examine each report and notify the operator of any apparent errors or omissions.

(3) The operator shall respond to the bureau's request within 60 days of receipt.
Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1), 378.404(8) FS. History--New 7-16-87, Formerly 16C-36.011.

62C-36.012 Violations, Injunctive Relief, and Penalties.

(1) Upon determination by the executive director that an operator is in violation of any requirement of this chapter, he shall notify the operator in writing by certified mail of the nature of the violation and specify dates by which corrective action shall begin and be completed.

(2) If the operator fails to take corrective action as specified in the notice of violation, the executive director may institute civil action in a court of competent jurisdiction to seek injunctive relief to enforce compliance with the requirements of this chapter and to impose and recover any civil penalty allowed by section 120.69, Florida Statutes.

(3) Any operator who begins resource extraction without meeting the requirements of this chapter is liable, pursuant to section 378.409, Florida Statutes, to the state for any damages.
Specific Authority 370.021, 378.404 FS. Law Implemented 120.69, 378.408, 378.409 FS. History--New 7-16-87, Formerly 16C-36.012.

62C-36.013 Donations of Land. (REPEALED)
Specific Authority 370.021, 378.404 FS. Law Implemented 211.32 FS. History--New 7-16-87, Formerly 16C-36.013, Repealed 10-20-96.

62C-36.014 Forms.

The following forms are available from the Bureau of Mine Reclamation and are incorporated by reference:

(1) Notice of Intent to Mine Limestone, Limestone Form 1, DNR 53-025(16), effective 7/87.

(2) Limestone Mine General Information and Conceptual Plan for Mining and Reclamation, Limestone Form 2, DNR 53-026(16), effective 7/87.

(3) Limestone Mine Conceptual Plan Change for Mining and Reclamation, Limestone Form 3, DNR 53-027(16), effective 7/87.

(4) Limestone Mine Annual Mining and Reclamation Report, Limestone Form 4, DNR 53-028(16), effective 7/87.

(5) Limestone Mine Notice of Cessation of Operations, Limestone Form 6, DNR 53-029(16), effective 7/87.

(6) Limestone Mine Reclamation Release Request, Limestone Form 5, DNR 53-030(16), effective 7/87.
Specific Authority 370.021, 378.404, 378.501(3) FS. Law Implemented 378.404(1), (2), 378.501(3) FS. History--New 7-16-87,Formerly 16C-36.014.

CHAPTER 62C-37
HEAVY MINERAL RECLAMATION REQUIREMENTS

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62C-37.001 Intent and Applicability. (REPEALED)
Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.412 FS. History--New 2-22-87, Formerly 16C-37.001, Repealed 10-20-96.

62C-37.002 Definitions.

For the purpose of this chapter, the following words and terms shall have the definitions and meanings ascribed to them in this section:

(1) "Agency" means an official, committee, department, commission, officer, division, authority, bureau, council, board, section, or unit of government within the state, including a county, municipality, or other local or regional entity or special district.

(2) "Bureau" means the Bureau of Mine Reclamation, 903 West Tennessee Street, Tallahassee, Florida 32304.

(3) "Department" means the Governor and Cabinet, sitting as the head of the Department of Environmental Protection.

(4) "Executive director" means the chief administrative officer of the department or his designee.

(5) "Existing mine" means any mine upon which an operation is being conducted, or has been conducted, on October 1, 1986.

(6) "Extraction" means the removal of heavy minerals from their location, so as to make them suitable for commercial, industrial, or construction use; but does not include excavation solely in aid of on-site farming or on-site construction, nor the process of searching, prospecting, exploring, or investigating for heavy minerals.

(7) "Heavy minerals" means those resources found in conjunction with sand deposits which have a specific gravity of not less than 2.8, and includes an admixture of such resources as zircon, staurolite, and titanium minerals as generally mined in Florida.

(8) "Local government" means any county or municipality.

(9) "Mine" means an area of land upon which mining operations have been conducted, are being conducted, or are planned to be conducted, as the term is commonly used in the trade.

(10) "New mine" means any mine where the operator begins the clearing of land for mining after July 1, 1987.

(11) "On-site" means within the contiguous limits of an area of land under one ownership or control and upon which farming or construction activities are taking place. Areas of land that are divided by public or private roads are considered contiguous if such areas are under one ownership or control.

(12) "Operation" means any activity, other than prospecting, necessary for site preparation, extraction, waste disposal, storage, or reclamation.

(13) "Operator" means any person engaged in an operation.

(14) "Reclamation" means the reasonable rehabilitation of land where heavy mineral extraction has occurred.

(15) "Temporary land use" means any use of lands under reclamation or restoration after contouring is complete, but before release, that is necessary for the mining operation or other reclamation or restoration activities within the mine.

(16) "Wetlands" means any area having dominant vegetation as defined and listed in Department of Environmental Protection Rule 62-301.400, Florida Administrative Code, regardless of whether the area is within the Department of Environment Regulation's jurisdiction or whether the water bodies are connected. Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.403, 378.404, 378.601 FS. History--New 2-22-87, Formerly 16C-37.002.

62C-37.003 Applications Required.

(1) Conceptual Plan. Prior to July 1, 1987, no operator may begin the process of heavy mineral extraction at a new mine without filing an application for a conceptual plan with the department at least six months prior to the beginning of mining operations. After July 1, 1987, no operator may begin the process of heavy mineral extraction at a new mine without receiving approval of a conceptual reclamation plan from the department. The conceptual plan application shall include the following information to allow documentation, review, and evaluation of proposed reclamation activities and to allow determination of compliance with the standards in this chapter.

(a) General information.

1. Operator's name, mailing address, business address, and phone number.

2. Name of parent company, corporation, etc., mailing address, business address, and phone number.

3. Mine name, mailing address, business address, and phone number.

4. Authorized agent's name, mailing address, business address, and phone number.

5. Date mining operations began or are to begin at this mine.

6. Mine location by county, township, range, section, and quarter-section.

(b) Premining information. The plan shall include descriptions of the following, as they existed prior to mining:

1. Geology, topography, drainage, vegetation, and land uses within the mine.

2. The presence and location of plant and animal species listed as threatened or endangered by the Florida Game and Fresh Water Fish Commission or the U. S. Fish and Wildlife Service.

(c) Mining, waste disposal, and reclamation plan. The plan shall describe each of the following:

1. The general mining, waste disposal, and reclamation methods from the initial clearing of the land to the final revegetation.

2. The general sequence of mining, including an estimated time schedule.

3. Estimated quantities, by weight and volume, of earth materials to be considered in planning the reclamation activities.

4. Postreclamation topography, drainage, vegetation, and intended land uses.

5. Postreclamation structures.

(d) Maps. Separate maps shall be provided that show the:

1. Site plan and location.

2. Premining topography and drainage.

3. Premining vegetation.

4. Total area to be mined and disturbed. This map shall also show a best estimate of the area projected to be mined in each five-year period of the mine's life.

5. Postreclamation topography and drainage.

6. Postreclamation vegetation.

(e) Other supporting documents. The application shall include other supporting documents, as follows:

1. A list of approved permits. This shall include copies of any dredge and fill permits approved by the U. S. Army Corps of Engineers or the Florida Department of Environmental Protection.

2. A list of pending permit applications which are related to reclamation.

3. A list of other permits which are related to reclamation and are known to be required.

4. A copy of the Application for Development Approval and the Development Order, if applicable.

(2) Modification to an Approved Conceptual Plan. An operator shall submit applications for modifications, as needed, for all changes to approved conceptual plans.

(a) All applications for modifications shall include the following information:

1. Name of mine.

2. Name of operator.

3. Permit identification code for approved plan.

4. What modification is requested.

(b) Applications for modifications that cover changes relating to areas, except areas to be deleted, within the currently approved mine boundary shall include the following additional information:

1. Why the modification is requested.

2. What alternatives were considered.

3. Why the requested modification was chosen.

(c) Applications for modifications that cover areas to be deleted from within the currently approved mine boundary shall include the information required in subsection (1) above to the extent that the deletion will affect the currently approved area.

(d) Applications for modifications that cover areas to be added to the currently approved mine boundary shall include the information required in subsection (1) above, if the added area will not affect the currently approved area. However, if the added area will affect the currently approved area, then the modification application shall also

include the information required in paragraph (b) above.

(e) Significant changes to approved conceptual plans are changes that affect or result in a cumulative change of more than 640 acres or more than 20 percent, whichever is smaller, of the area covered by the conceptual plan, as originally approved or most recently modified by the department.

(3) Program. Each operator shall have an approved program prior to beginning reclamation activities upon any site which is subject to the requirements of this chapter. Program applications shall include the following information:

(a) General information.

1. Operator's name, mailing address, business address, and phone number.

2. Name of parent company, corporation, etc., mailing address, business address, and phone number.

3. Mine name, mailing address, business address, and phone number.

4. Authorized agent's name, mailing address, business address, and phone number.

5. Date mining operations began or are to begin within the application area.

6. Program area location by county, township, range, section, and quarter-section.

(b) A detailed description of the activities to be undertaken to comply with each of the standards in section 62C-37.008. The information provided shall be sufficient to determine whether or not each standard will be met.

(c) Separate maps shall be provided that show the:

1. Postreclamation topography and drainage.

2. Postreclamation vegetation.

3. Area to be mined and area to be disturbed, but not mined.

(d) Cross sections shall be provided for each water body and wetland.

(e) A description of any temporary land use requested, including the estimated dates the temporary land use will be in effect, what reclamation activities will be needed when the temporary land use ceases, and a time schedule for the reclamation activities.

(4) Amendment to an Approved Program. Each operator shall have an approved amendment for all changes to a program before initiating such changes.

(a) An amendment application shall include the following information:

1. Name of mine.

2. Name of operator.

3. Permit identification code for approved program.

4. What change is requested.

5. Why the change is requested.

6. What alternatives were considered.

7. Why the requested change was chosen.

(b) Significant changes to approved programs are changes that affect or result in

a cumulative change of more than 100 acres or more than 20 percent, whichever is smaller, of the area covered by the program, as originally approved or most recently amended by the executive director.

(c) Changes required by permit conditions or requirements imposed by other agencies, including federal agencies, shall not be considered significant when such changes are consistent with the reclamation standards in section 62C-37.008.

(d) Requests for temporary land uses on approved programs shall be filed as amendments.

(5) Time schedule changes that are the result of changes in the rate of mining shall not be considered modifications or amendments, but shall be reported in the annual report.

(6) An operator shall notify the executive director of any changes of land ownership or operators at a mine within at least 30 days after such changes.

(7) An operator shall notify the executive director no later than six months after the temporary cessation and 30 days after the permanent cessation of mining at a mine.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.601 FS. History--New 2-22-87, Formerly 16C-37.003.

62C-37.004 Document Format and Standards.

(1) All applications for conceptual plans, modifications, programs, and amendments shall be submitted in accordance with the document format and standards in this section.

(2) All copies of documents shall be of good quality and clearly legible.

(3) At least one copy of all documents that are to be signed shall bear an original signature.

(4) All documents shall be submitted in an 8 1/2- by 11-inch format.

(5) All pages of text, maps, drawings, cross sections, and other documents shall have a minimum margin of one inch on all sides.

(6) Original maps, drawings, and cross sections may be larger than 8 1/2 inches by 11 inches, but no larger than 30 inches by 40 inches. Copies of such oversized documents shall be available in both the original scale and the format required in subsections (4) and (5) above.

(7) All maps, drawings, and cross sections shall be of a scale suitable to show the required information. The original map scale for conceptual plans and modifications shall be one inch equals 2000 feet. The original map scale for programs and amendments shall be no smaller than one inch equals 500 feet, unless the application area will not fit within the format requirements of subsections (5) and (6) above.

(8) All maps, drawings, and cross sections shall include at least the following information:

(a) Titles that explain their purpose.

(b) Legends that explain all symbols and patterns used.

(c) Scales, where appropriate. Scale bars shall be provided at a minimum.

(d) Location, where appropriate, including sections, townships, ranges, and counties. Maps or plan views shall include at least three fixed points referenced to section corners. When possible these points shall be section corners, but they should not be in a straight line. Cross sections shall have clearly defined end points that shall be located accurately on an inset or other map.

(e) North arrow, where appropriate.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.601 FS. History--New 2-22-87, Formerly 16C-37.004.

62C-37.005 Application Procedures.

(1) Preapplication meetings. In order to reduce the time required for processing applications, preapplication meetings are encouraged and should be arranged in accordance with the following:

(a) Prior to submitting an application to the bureau, the applicant should notify the bureau in writing that an application is due to be submitted. The notice should state the purpose of the application and whether or not a preapplication meeting is desired and include a map that outlines the application area.

(b) If a meeting is requested by the applicant, the bureau staff shall meet with the applicant at the earliest practical time or as otherwise agreed to by both parties.

(c) These meetings are for the purpose of exchanging ideas and information and shall be nonbinding on either party.

(2) Filing. Applications shall be filed with the bureau in accordance with the following deadlines:

(a) Conceptual plans. Conceptual plan applications shall be filed at least six months prior to beginning mining operations. Effective April 1, 1987, if the operator is required to prepare an Application for Development Approval (ADA) under chapter 380, F. S., the operator shall file the conceptual plan within seven days of the submittal of the ADA.

(b) Conceptual plan modifications. Modification applications shall be filed at least 90 days prior to beginning activities that require modification to an approved conceptual plan.

(c) Programs. Program applications shall be filed at least six months, but no more than two years, prior to the anticipated commencement of extraction in the application area.

(d) Amendments. Amendment applications shall be filed at least 90 days prior to beginning activities which are significant changes to an approved program and at least 30 days prior to beginning activities which are not significant changes to an approved program.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.601 FS. History--New 2-22-87, Formerly 16C-37.005.

62C-37.006 Application Review Procedures.

All applications shall be reviewed in accordance with the following procedures:

(1) Within 30 days after receipt of an operator's application for a conceptual plan, modification, program, or amendment, the executive director shall review the plan, modification, program, or amendment and shall request the submittal of all additional information the agency is permitted by law to require.

(2) The operator shall provide the requested additional information within 45 days of receipt of the request or request an extension to the 45-day period. The extension request shall include the date by which the information can be provided and the reason for the extension. The executive director or his designee shall approve reasonable requests that are based on a need to complete data collection. If the operator does not provide the requested information within the 45-day period or request an extension, the executive director may proceed to final action.

(3) If the operator believes any request for additional information is not authorized by law or department rule, the operator may request a hearing pursuant to section 120.57, Florida Statutes.

(4) Within 30 days after receipt of the requested additional information, the executive director shall review it and may request only such information needed to clarify the received additional information.

(5) If the operator believes the request of the executive director for such additional information, requested pursuant to subsection (4) above, is not authorized by law or department rule, the department, at the operator's request, shall proceed to process the application.

(6) Applications shall be approved, approved with conditions, or denied within 90 days after receipt of the original application, the last item of timely requested additional information, or the operator's written request to begin processing the application, as follows:

(a) The department shall take final action on conceptual plans and any application that includes significant changes to an approved conceptual plan.

(b) The executive director shall take final action on all applications that do not require final action by the department.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.405, 378.601 FS. History--New 2-22-87, Formerly 16C-37.006.

62C-37.007 Confidentiality and Availability of Records.

(1) All information received by the agency shall be handled, with respect to confidentiality, pursuant to section 378.406, Florida Statutes.

(2) Each original page of all confidential documents shall be stamped by the

operator with the word CONFIDENTIAL in bold red letters.

(3) The legal basis for the confidentiality of any information shall be provided as a cover statement for all documents containing confidential information.

(4) All information received from the operator, except as provided in subsection 378.406(1), Florida Statutes, shall be available for public inspection and duplication, pursuant to subsection 378.406(2), Florida Statutes.

Specific Authority 370.021, 378.404, 378.406, 378.601 FS. Law Implemented 378.404, 378.406, 378.601 FS. History--New 2-22-87, Formerly 16C-37.007.

62C-37.008 Reclamation Standards.

The following standards shall apply to each program area, unless otherwise specified:

(1) The program area shall be delineated based on the following:

(a) All acres shall be contiguous.

(b) The program area shall have simple boundaries and, therefore, may include areas which will not be disturbed by mining activities.

(c) The program area must be large enough to include appropriate drainage features, such as lakes, wetlands, and streams and enough of the surrounding uplands to evaluate the function of each feature.

(d) The program area shall consist of a logical unit which has a boundary that is based on a consideration of the standards in this section. The bureau may request alterations in the originally submitted boundary as part of the bureau's evaluation of the completeness of the application.

(e) The program area shall include at least one year of mining and shall not exceed 640 acres, unless an area of 640 acres or less would not constitute a logical unit pursuant to the other standards in this subsection.

(f) The program area for waste disposal sites must include the entire waste disposal site, if such site includes slurried wastes contained by a dam.

(2) Safety.

(a) Site cleanup. All lands reclaimed shall be completed in a neat, clean manner by removing or adequately burying all visible debris, litter, junk, worn-out or unusable equipment or materials, as well as all footings, poles, pilings, and cables. If any large rocks or boulders exist as a result of mining, these should be left either at the surface where they are distinctly visible or placed in mined-out areas and covered to a minimum depth of four (4) feet.

(b) Structures. All temporary buildings, pipelines, and other man-made structures shall be removed with the exception of those that are of sound construction with potential use compatible with the reclamation goals.

(3) Backfilling and Contouring.

(a) The proposed land use after reclamation and the types of landforms shall be those best suited to enhance the recovery of the land into mature sites with high

potential for the intended land use.

(b) Slopes of any reclaimed land area shall be no steeper than four (4) feet horizontal to one (1) foot vertical to enhance slope stabilization and provide for the safety of the general public. For long continuous slopes, mulching, contouring, or other suitable techniques shall be used to enhance stabilization. Should washes or rills develop after revegetation and before final release of the area, the operator shall repair the eroded areas and stabilize the slopes to eliminate any further similar erosion.

(4) Soil Zone.

(a) The use of good quality topsoils is encouraged, especially in areas of reclamation by natural succession.

(b) Where topsoil is not used, the operator shall use a suitable growing medium for the type of vegetative communities planned.

(5) Wetlands which are within the conceptual plan area which are disturbed by mining operations shall be restored to at least premining surface areas.

(6) Wetlands and Water Bodies. The design of artificially created wetlands and water bodies shall be consistent with health and safety practices, maximize beneficial contributions within local drainage patterns, provide aquatic and wetland wildlife habitat values, and maintain downstream water quality by preventing erosion and providing nutrient uptake. Water bodies should incorporate a variety of emergent habitats, a balance of deep and shallow water, fluctuating water levels, high ratios of shoreline length to surface area and a variety of shoreline slopes.

(a) At least 25% of the highwater surface area of each water body shall consist of an annual zone of water fluctuation to encourage emergent and transition zone vegetation. This area will also qualify as wetlands under the requirements of (5) above if requirements in 62C-37.008(9)(d) are met. In the event that sufficient shoreline configurations, slopes, or water level fluctuations cannot be designed to accommodate this requirement, this deficiency shall be met by constructing additional wetlands adjacent to and hydrologically connected to the water body.

(b) At least 20% of the low water surface area shall consist of a zone between the annual low water line and six feet below the annual low water line to provide fish bedding areas and submerged vegetation zones.

(c) The operator shall give a high priority to a lake perimeter green belt of vegetation consisting of tree and shrub species indigenous to the area in addition to ground cover.

(7) Water Quality.

(a) All waters of the state on or leaving the property under control of the taxpayer shall meet applicable water quality standards of the Florida Department of Environmental Protection.

(b) Water within all wetlands and water bodies shall be of sufficient quality to allow recreation or support fish and other wildlife.

(8) Flooding and Drainage.

(a) The operator shall take all reasonable steps necessary to eliminate the risk that there will be flooding on lands not controlled by the operator caused by silting or damming of stream channels, channelization, slumping or debris slides, uncontrolled erosion, or intentional spoiling or diking or other similar actions within the control of the operator.

(b) The operator shall restore the original drainage pattern of the area to the greatest extent possible. Watershed boundaries shall not be crossed in restoring drainage patterns; watersheds shall be restored within their original boundaries.

(9) Waste Disposal.

(a) Waste disposal areas shall be reclaimed as expeditiously as possible. Experimental methods which speed reclamation which are consistent with these rules are encouraged.

(b) To the greatest extent practical, all waste shall be disposed of in a manner that reduces the volume needed for disposal.

(c) Above-ground retention areas shall be reclaimed in a manner so that long-term stabilization of dams is assured.

(10) Revegetation. The operator shall develop a revegetation plan to achieve permanent revegetation, minimize soil erosion, conceal the effects of surface mining, and recognize the requirements for appropriate habitat for fish and wildlife.

(a) The operator shall develop a plan for the proposed revegetation, including the species of grasses, shrubs, trees, aquatic and wetlands vegetation to be planted, the spacing of vegetation, and, where necessary, the program for treating the soils to prepare them for revegetation.

(b) All upland areas must have established ground cover for one year after planting over 80% of the reclaimed upland area, excluding roads, groves, or row crops. Bare areas shall not exceed one-quarter (1/4) acre.

(c) Upland forested areas shall be established to resemble premining conditions where practical and where consistent with proposed land uses. At a minimum, 10% of the upland area will be revegetated as upland forested areas with a variety of indigenous hardwoods and conifers. Upland forested areas shall be protected from grazing, moving, or other adverse land uses to allow establishment. An area will be considered to be reforested if a stand density of 200 trees/acre is achieved at the end of one year after planting.

(d) All wetland areas shall be restored and revegetated in accordance with the best available technology.

1. Herbaceous wetlands shall achieve a ground cover of at least 50% at the end of one year after planting and shall be protected from grazing, mowing, or other adverse land uses for three years after planting to allow establishment.

2. Wooded wetlands shall achieve a stand density of 200 trees/acre at the end of one year after planting and will be protected from grazing, mowing, or other adverse land uses for five years or until such time as the trees are ten feet tall.

(e) All species used in revegetation shall be indigenous species except for agricultural crops, grasses, and temporary ground cover vegetation.

(11) Wildlife.

(a) The operator shall identify what measures have been incorporated into the conceptual plan or program to offset fish and wildlife values lost as a result of mining activities and shall identify special programs to restore, enhance, or reclaim particular habitats, especially for endangered and threatened species, as identified by the Florida Game and Fresh Water Fish Commission or the U. S. Fish and Wildlife Service.

(b) The operator may designate specific locations within the mine as "Wildlife Areas" and include a plan for reclamation and management for sites so designated. Slopes, revegetation, and erosion control requirements may be waived or modified by the department in such areas on a case-by-case basis where such changes will benefit the overall plan for the propagation of wildlife.

(12) Time Schedule.

(a) Each operator shall develop a time schedule for completion of the reclamation process in the area covered by the application. The time schedule shall include an estimate of:

1. When removal of heavy minerals in the area will be completed, including the estimated acreage to be mined in each calendar year that mining will occur.

2. When any other mining operations phase in the area will be completed and an explanation of such operations.

3. When waste disposal will be started and completed.

4. When the contouring will be started and when completed.

5. When revegetation will be started and completed.

(b) Completion dates.

1. Where mined-out areas will be used for waste disposal, waste disposal shall be completed as soon as practical after mining has occurred. The completion date for waste disposal shall consider the availability and volume of materials needed.

2. Contouring for all acres mined in a given calendar year shall be completed no later than 18 months after the end of that calendar year or 18 months after an area is capable of being contoured when additional mining operations, such as waste disposal, occur.

3. Revegetation for any given area shall be completed no later than six months after the required completion of contouring in that area.

4. Reclamation and restoration shall be completed within three years of the actual completion of mining operations, inclusive of a one-year period after planting the required vegetation to allow for establishment. The required completion date may vary within a program, depending upon the specific sequence of mining.

5. The completion date for reclamation and restoration activities shall be extended by the period of any delays attributable to causes beyond the reasonable control of the operator.

6. Initiation dates shall be the first day of the appropriate calendar month; completion dates shall be the last day of the appropriate calendar month.

(13) Exceptions and Innovations. Exceptions to the standards contained in this section may be granted by the executive director for experimental or innovative techniques.

(14) Remaining Natural Resources. The operator shall take care to protect the nature resources within the mine which are not affected by mining of the heavy minerals. Highest priority shall be given to the following concerns:

(a) Protection of endangered and threatened species and their habitat.

(b) Protection of surface drainage patterns and water quality, including the natural resources and integrity of natural streams and their flood plains.

(c) Protection of uplands from erosion, loss of topsoil, and vegetation loss.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.601 FS. History--New 2-22-87, Formerly 16C-37.008.

62C-37.009 Inspections. (REPEALED)

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.407, 378.601 FS. History--New 2-22-87, Formerly 16C-37.009, Repealed 10-20-96.

62C-37.010 Release Procedures.

(1) Upon completion of reclamation requirements in a program area, the operator shall notify the executive director.

(2) Within 60 days after receipt of the notification, the executive director shall notify the operator in writing whether or not in inspection will be made within one year after receipt of the operator's notification. The executive director's notification shall include the date the inspection will occur, if an inspection is scheduled.

(3) Within 30 days after the inspection, the executive director shall notify the operator in writing that the program area is released or what work must be done before release can be granted.

(4) If the executive director notifies the operator that the program area will not be inspected, the program area shall be released from reclamation requirements at the end of the second year after receipt of the operator's notification.

(5) If an operator wishes to resume mining operations within a released program area, the area to be disturbed shall be considered to be an undisturbed area for the purposes of this chapter and application shall be made in accordance with the full provisions of this chapter.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.407, 378.601 FS. History--New 2-22-87, Formerly 16C-37.010.

62C-37.011 Annual Reports.

(1) On or before March 1 of each year, each operator shall submit to the bureau

a detailed report for the previous calendar year for each mine under his control. The report shall be submitted in accordance with the document format and standards in section 62C-37.004 and shall include:

(a) Name and address of the operator, name of the mine, and year covered by the report.

(b) The number of acres from which heavy minerals were extracted during the year.

(c) The number of acres disturbed, but not mined, during the year and the nature of the disturbances.

(d) The number of acres on which mining operations, including waste disposal, were completed.

(e) A description of the reclamation activities that have taken place during the year.

(f) Maps that illustrate paragraphs (b) through (e) above. To the extent possible, maps submitted with each successive report shall include the information shown on maps submitted with previous reports.

(2) The bureau shall examine each annual report and notify the operator of any apparent errors or omissions.

(3) The operator shall respond to the bureau's request for corrections of apparent errors and omitted information within 60 days of receipt.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.601 FS. History--New 2-22-87, Formerly 16C-37.011.

62C-37.012 Violations, Injunctive Relief, and Penalties.

(1) Upon determination by the executive director that an operator is in violation of any requirement of this chapter, he shall notify the operator in writing by certified mail of the nature of the violation and specify dates by which corrective action shall begin and be completed.

(2) If the operator fails to take corrective action as specified in the notice of violation, the executive director may institute civil action in a court of competent jurisdiction to seek injunctive relief to enforce compliance with the requirements of this chapter and to impose and recover any civil penalty allowed by section 370.021, Florida Statutes.

(3) Any operator who begins resource extraction without meeting the requirements of this chapter is liable, pursuant to section 378.409, Florida Statutes, to the state for any damages.

Specific Authority 370.021, 378.404, 378.601 FS. Law Implemented 378.404, 378.408, 378.409, 378.601 FS. History--New 2-22-87, Formerly 16C-37.012.

62C-37.013 Donations of Land. (REPEALED)
Specific Authority 370.021, 378.404 FS. Law Implemented 211.32, 253.02 FS.
History--New 2-22-87, Formerly 16C-37.013, Repealed 10-20-96.

CHAPTER 62-672

MINIMUM REQUIREMENTS FOR EARTHEN DAMS USED IN PHOSPHATE MINING AND BENEFICIATION OPERATIONS AND FOR DIKES USED IN PHOSPHOGYPSUM STACK SYSTEM IMPOUNDMENTS

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62-672.100 General.

(1) Phosphate Mining and Beneficiation Operations. The provisions of rules 62-672.100(1) and 62-672.200 through 62-672.570 apply to phosphate mining and beneficiation operations in the manner and to the extent set forth therein. It is the conclusion of the Environmental Regulation Commission that the most common causes for past failures of earthen dams used for impoundment of liquid industrial wastes from phosphate mining and beneficiation operations have been insecure foundations, inadequate supervision of construction, poor routine inspections, and/or inadequate maintenance. It is the intent of the Environmental Regulation Commission to establish requirements which will eliminate or reduce failures of earthen dams to the greatest possible extent. This rule, therefore, emphasizes an intensive surveillance program which is designed to expose critical conditions in dams sufficiently in advance of failure to permit corrective maintenance and avoidance of disaster. It shall be incumbent upon owners of earthen dams to construct and maintain them on the basis that these requirements are minimum safety standards which shall normally be exceeded to ensure that there shall be no discharge from said dams into the waters of the State of Florida other than that specifically authorized by the Department of Environmental Protection. All earthen dams for impounding, above natural ground elevation, liquid industrial wastes from phosphate mining and beneficiation operations shall be constructed in accordance with a design and set of detailed specifications prepared, sealed and signed by a professional engineer registered in Florida who is competent in the field of dam design, construction and maintenance. Results of field and laboratory tests from an adequate number of test borings and soil samples shall be the basis for computations pertaining to seepage and stability analyses. Construction specifications contained in this rule shall apply to dams on which construction begins after the effective date of the rule. Inspection and maintenance specifications contained in this rule shall apply to all active and retired phosphate industry dams immediately upon the effective date of the rule.

(2) Phosphogypsum Stack Systems. The provisions of rules 62-672.100(2), 62-672.200, and 62-672.600 through 62-672.870 apply to phosphogypsum stack system impoundments in the manner and to the extent set forth therein. The purpose of these rules is to ensure the physical integrity of impoundments used to manage phosphogypsum and process water generated during the course of production of phosphate fertilizer. These rules establish minimum design, construction, operation, inspection and maintenance requirements to ensure that phosphogypsum stack system impoundments meet critical safety standards and do not cause unplanned releases to the environment. Owners of phosphogypsum stack systems are required to maintain inspection logs and to develop and maintain plans to respond to emergency conditions. All requirements of this rule shall apply upon effective date of this rule except as otherwise provided in specific provisions of this rule.

Specific Authority 403.06l(22), 403.4155, FS.
Law Implemented 403.061(22), 403.4155, FS.
History Revised 12-8-72. Previously numbered as 17-9.01. Formerly 17-9.001, Formerly 17-672.100, Amended 6-28-99.

62-672.200 Definitions.

(1) 100-Year Rainfall Event -- A rainfall event which is characterized by a mean return period of one hundred years ,i.e., a rainfall event which has a 99% probability for not being exceeded during any given year.

(2) 100-Year Annual Rainfall -- The 100-Year rainfall event representing total annual rainfall of 76 inches.

(3) Abandoned dam-An abandoned dam is one associated with a settling area from which sufficient water has been removed to make the residue no longer a pollutional threat to surface waters or a hazard of any type to land areas.

(4) Above-Grade Perimeter Earthen Dike – A perimeter earthen dike that has its design freeboard above the adjacent ground surface.

(5) Active dam-An active dam is one associated with a settling area into which wastewater is being introduced for purposes of clarification or in which free water remains in contact with the dam.

(6) Backup power – A secondary source of power not likely to fail simultaneously with the primary source.

(7) Beach or Delta – A gently sloping area of gypsum deposited within the settling compartment, above the process water level.

(8) Beneficiation – The processing of phosphate ore to separate the phosphate rock from the associated sand and clays.

(9) Berm-A shelf that breaks the continuity of the slope of an embankment in order to arrest the velocity of storm water flowing down the face and/or to enhance the stability of the embankment.

(10) Cast dam-A cast dam is one constructed of fill which was put in place by a dragline or other machine capable of free dumping, and is not mechanically compacted in progressive layers.

(11) Core-A zone of relatively impervious material within the dam to resist the flow of water through the dam.

(12) Cut-off-Trench-An excavation into the foundation material to accept an extension of the core.

(13) Department – The Florida Department of Environmental Protection.

(14) Dike -- A barrier to the flow of phosphogypsum and process water which is constructed of naturally occurring soil (earthen dike) or of phosphogypsum and which is a component of a phosphogypsum stack system.

(15) Drain -- A material more pervious than the surrounding fill which allows seepage water to drain freely while preventing piping or internal erosion of the fill material.

(a) Blanket drain is a continuous horizontal drain layer within or beneath the downstream portion of the dam.

(b) Chimney drain is a continuous sloping drain layer within the downstream portion of the dam.

(c) Toe drain is a wedge-shaped drain supporting the downstream toe of the dam.

(16) Earthen dam or dam -- A barrier to the flow of liquids which is constructed of naturally occurring soil and which is a component of a clay settling area.

(17) Earthen dike – A barrier to the flow of phosphogypsum and process water which is constructed of naturally occurring soil and which is a component of a phosphogypsum stack system.

(18) Engineer -- An engineer registered in the State of Florida in accordance with Chapter 471, F.S. and with experience in the design, construction, and operation of systems covered by this rule.

(19) Filter-A zone of material sufficiently more pervious than the dam or foundation so that free water will drain through the filter, but at the same time sufficiently fine grained to prevent piping of the fill material.

(20) Freeboard -- The height of the lowest point on the crest of the dam or dike crest, excluding the emergency spillway, above the highest adjacent liquid surface within the impoundment.

(21) Gypsum dike -- The outermost dike constructed within the perimeter formed by a starter dike for the purpose of raising a phosphogypsum stack and impounding phosphogypsum and/or process water. This term specifically excludes any dike inboard of a rim ditch, any partitions separating stack compartments, or any temporary windrows placed on the gypsum dike.

(22) Inside (upstream) slope --The face of the dam or dike which will be in contact with the impounded liquids.

(23) Log -- A written record maintained by the owner of an earthen dam or a phosphogypsum stack system that contains a schedule of inspections of system components, the findings of such inspections, and any remedial measures taken in response to such findings.

(24) New perimeter earthen dike -- A perimeter earthen dike which is the subject of a complete application for a department permit to construct or laterally expand a phosphogypsum stack system submitted to the department after June 28, 1999.

(25) Non-clay phosphate mining impoundments – Above-grade, non-clay phosphate mining/reclamation berms and impoundments such as:

(a) units under reclamation receiving hydraulic fill;

(b) units constructed for impounding stormwater runoff;

(c) structures located in mine cuts that could impound water above grade, and where a failure of such structure could result in a release of waters to waters of the state; and

(d) perimeter ditch and berm systems that impound water above grade.

(26) Operation plan -- The operation plan required by 62-673.340(3).

(27) Outside (downstream) slope --The face of the dam or dike which will not be in contact with the impounded liquids.

(28) Perimeter earthen dike -- The outermost earthen dike surrounding a phosphogypsum stack system that has not been closed or any other earthen dike the failure of which could cause a release of process water outside the phosphogypsum stack system.

(29) Phosphogypsum or gypsum -- The definition of "phosphogypsum" set forth in rule 62-673.200(13) is adopted and incorporated by reference.

(30) Phosphogypsum stack or stack -- The definition of "phosphogypsum stack" set forth in rule 62-673.200(14) is adopted and incorporated by reference.

(31) Phosphogypsum stack system – The definition of "phosphogypsum stack system" set forth in rule 62-673.200(15) is adopted and incorporated by reference.

(32) Phreatic Surface --The upper surface of the water table within the mass of the dam or dike. It would be the elevation of the water surface if an open hole were dug into the dam.

(33) Piping --Progressive erosion of soil or solid material within the dam or dike, starting downstream and working upstream, creating a tunnel into the dam or dike. Piping occurs when the velocity of the flow of seepage water is sufficient for the water to transport material from the embankment.

(34) Process Water -- The definition of "process wastewater" set forth in rule 62-673.200(16) is adopted and incorporated by reference.

(35) Qualified Company Employee – An employee trained pursuant to rule 62-672.800 specifically in the area of their job duties.

(36) Retired dam-A retired dam is one associated with a settling area into which no additional wastewater is currently being introduced but which could be reactivated.

(37) Rolled dam-A rolled dam is one constructed of fill which is placed in layers which are mechanically compacted individually prior to placement of the next higher layer.

(38) Safety Factor-A numerical value which represents the ratio of the ultimate strength of a material or structure to the stress which will be applied to that material or structure.

(39) Settling area --A phosphate mining clay settling area surrounded by dams, embankments, or natural soil masses in which liquids are introduced for the

purpose of separating suspended solid matter from water used for transportation of such matter.

(40) Starter Dike – The initial dike constructed at the base of a phosphogypsum stack to begin the process of storing phosphogypsum.

(41) Tailwater level --The elevation of the water at the downstream toe of the dam or dike.

(42) Third-party engineer – An engineer who is not an employee of any entity that owns or operates a phosphate mine or phosphate fertilizer manufacturing facility.

(43) Toe --The toe of the dam or dike is the junction between the face of the dam or dike and the adjacent terrain.

Specific Authority 403.061(22), 403.4155, FS.
Law Implemented 403.061(22), 403.4155, FS.
History Revised 12-8-72. Previously numbered as 17-9.02. Formerly 17-9.020, Formerly 17-672.200, Amended 6-28-99.

Part I - Phosphate Mining and Beneficiation Operations

62-672.300 Construction of New Dams.

(1) Design.

(a) Site investigation-The general area desired for use as a settling area shall be carefully inspected by the design engineer prior to selection of the exact location for a dam. Areas of uneven natural subsidence, sink-hole, pockets of organic matter, or other unstable soils shall be avoided, unless special provisions are made for their correction.

(b) Soil testing-A program of soil sampling and testing adequate to determine the characteristics of the foundation material which will support the proposed dam and of the material to be used for construction of the dam shall be performed. Sampling shall include borings or in-place samples from the exposed excavation face. All borings shall be logged using a recognized engineering soil classification system, (such as Unified System) with location and depths of all samples recorded on the log. Tests such as the determination of in-place densities, shear-strength; and permeabilities of the foundation and embankment soils shall be performed. Tests on foundation soils shall be performed on either undisturbed samples or on the in-place soil. Tests on embankment soils shall be performed on samples remolded to the densities to be used in construction.

(c) Cross Section design-There shall be a minimum freeboard of five feet (5') below the inside crest. The outside crest of the top of the dam shall be higher than the inside crest in order to force all crest drainage to the inside of the dam. Both inside and outside slopes shall be no steeper than two horizontal to one vertical. The design shall provide positive seepage control features, such as:

1. Cut-off trench in natural soil foundations.

2. Clay core.
3. Blanket drain.
4. Chimney drain and toe drain.

The top of the dam shall include a roadway which will permit wheeled vehicle traffic at all times. The design shall also incorporate an all-weather roadway near the downstream toe which will permit wheeled vehicle traffic around the perimeter of the dam for purposes of inspection of the slope, toe and natural ground beyond the toe, as well as maintenance.

(d) Stability analysis-A flow net analysis shall be made to determine the location of the phreatic surface, flow lines, and lines of equal head within the foundation and fill being designed. This analysis may be based on graphical construction, electrical or liquid analogs, soil prototype methods, or other accepted methods. The flow net and stability analysis shall use the maximum pool elevation with not less than five feet (5') of clear water, this elevation being five feet (5') below the inside crest of the dam. Possible fluctuations of the tailwater level shall be included in the analyses.

(e) Design safety factors-The designing engineer shall use the following minimum safety factors: 1.75 for horizontal shear at base of fill; 1.5 for horizontal shear within the fill due to seepage through the outer face; 1.5 for bearing capacity of foundation soils; 1.5 for protection against shear failure of any circular arc in either inside or outside slope. It is imperative that water pressure distribution be included in the analyses.

(f) If a cast dam is to be constructed where adequate site preparation, as defined in rule 62-672.300(2) below, has not been accomplished; or where the fill materials do not meet the requirements of rule 62-672.300(3) below; then the design shall incorporate either of the following alternatives:

1. A portion of the material which forms the downstream slope shall be removed and the foundation thus exposed shall be prepared in the same manner as is prescribed herein for a rolled dam. Fill material shall then be placed as a rolled embankment which shall be of such design that the safety factor with respect to downstream movement of the rolled section shall be no less than 1.2 when assuming that the remaining cast material below the phreatic surface has become liquid.
2. Sand tailings shall be placed against the downstream slope to the extent that the wedge so formed shall have a safety factor with respect to downstream movement of no less than 1.2 when assuming that the cast material below the phreatic surface has become liquid.

(g) When the foundation for a cast dam meets the requirements of rule 62-672.300(2) and the materials used for the fill meet the requirements of rule 62-672.300(3), then the dam shall be designed in accordance with rules

62-672.300(1)(a)(b)(c)(d) and (e); except that the computations of all required safety factors shall be based on only seventy-five percent (75%) of the indicated strengths of the cast materials which are tested at the same density as will exist within the dam.

(2) Site Preparation-Ground which will become the foundation of earthen dams shall be stripped of all vegetation and organic detritus or residue, including muck, mud, slimes, or other material which would flow or undergo excessive consolidation under heavy loading. All earth foundation surfaces on which fill is to be placed shall be scarified or moistened and compacted prior to spreading of first course of fill material, and the dam base shall be well drained during construction, except when placing hydraulic fill.

(3) Material to be Used -- Material used for earthen dams shall be free of stumps, vegetation, trees, palmettos, muck, and other extraneous matter which could affect the compactability, density, permeability, or shear strength of the finished dam. Tailings may be used for dam fill when such a completed dam will meet the seepage and structural requirements in rule 62-672.300(1).

(4) Water level control-Sufficient water level control structures shall be installed in the impoundment area behind an earthen dam to maintain the minimum 5' freeboard and to accommodate the release of storm water resulting from heavy rainfall. Such structures shall be adequate to accommodate twelve (12) inches of rainfall on the watershed involved during any period of twenty-four (24) hours. All settling areas covering an area greater than fifty (50) acres shall have no fewer than two (2) water level control structures.

(5) Methods of Construction.

(a) Each new dam shall be constructed to meet or exceed the minimum safety requirements of the specifications and design for that dam. Draglines, drag scrapers, tractor or other appropriate earth moving equipment shall be used to place materials in dam construction. Materials used in rolled dams shall be blended prior to compaction. The soil shall be compacted and density tests shall be performed to ensure that the designed densities are obtained. During dam construction, quality control/quality assurance inspections shall be conducted by the engineer of record or a personal representative under his or her direct supervision. A third-party engineer or his or her representative shall be on site at all times during dam construction and during installation of all spillways. The department shall be advised 48 hours prior to construction or shaping of a new dam so that a department representative can inspect the site.

(b) Tailings may be deposited hydraulically on the upstream slopes of existing dams provided that the elevation of the discharge water is never higher than five feet below the adjacent crest of the dam. If water is impounded above natural ground level, tailings may be deposited on the downstream portion of a dam by either of the following procedures:

1. If the tailings are dewatered to not less than 50% solids by weight at the discharge point, the tailings may be deposited continuously.

2. If the discharge point is at or beyond the point at which the toe meets the foundation, or the discharge point is at least seventy-five (75) feet from the point at which water meets the dam, the tailings may be deposited continuously by hydraulic methods.

(c) Areas around any water level control structure pipe, any other conduit, or any surface of discontinuity between materials within the mass of the dam shall be carefully installed to avoid potential concentration of seepages. The design of spillway structures associated with earthen dams shall ensure that soils under and around a culvert are uniformly compacted and are in continuous contact with the external culvert surface. All conduits through dams shall have two or more seepage collars spaced in accordance with good engineering practices pertinent to the material used for the fill. Two collars will be installed within the core when there is a core within a dam. A third-party engineer shall evaluate the potential for piping around culverts and the engineering design shall reduce or eliminate such potential based upon site specific conditions. All pipes and joints in pipes extending through a dam shall be made leakproof and shall be constructed of materials suitable for the fluids carried and the load imposed. The elevation difference of any spillway pipe from its inlet to the outlet at the discharge ditch shall not cause supercritical flow conditions within the culvert. In order to avoid leaks associated with differential settlement, conduits through dams shall not be rigidly supported by piles or piers. Backfill around conduits shall be of a density that is equal to or greater than those of the surrounding embankment. Particular attention shall be devoted to the lower third of the conduit. The engineering design for the construction of a culvert shall require the use of a lean concrete cradle and gravel drain system or a design resulting in an equivalent level of protection.

(6) Documentation.

(a) After completion of construction and before the above-grade deposition of industrial waste behind the dam, the permittee shall contact the department to arrange for a department representative to inspect the facility in the company of the permittee. The owner of an earthen dam shall maintain in a permanent file the following construction records pertaining to said dam. The owner shall furnish a copy of the file and certification of completion of construction within 30 days after completion of the dam to the department.

1. Aerial photo of construction site after mining in the immediate area has been terminated and before shaping of the final dam.
2. Design drawings and calculations.
3. Design specifications.
4. Results of all soil tests on foundations and fill materials.
5. Logs of borings and engineering geology reports.

6. Certified copies of construction progress inspections pertinent to core trench, toe drain, internal drains, and other significant phases of the structure. Photographs of various structural items may be included in the file.

7. Aerial photo of completed dam taken within 30 days after construction is completed, weather permitting.

8. Description of and justification for all deviations or variances from the design plans or specifications.

Specific Authority: 403.06l(22), FS.
Law Implemented: 403.06l(22), FS.
History: Revised 12-8-72. Previously numbered as 17-9.03. Formerly 17-9.030, Formerly 17-672.300, Amended 6-28-99.

62-672.400 Operational Requirements.

(1) Active dams-The water level in a settling area shall not be raised or lowered more than one (1) foot during any twenty-four (24) hour period, except under emergency conditions. The water level shall not be lowered more than five (5) feet per month. Each active settling area shall be inspected as prescribed in rule 62-672.500(2). Instrumentation for monitoring of seepage pore pressures within dams shall be installed and operated unless the department has been provided reasonable assurance during the permitting process that such monitoring is unnecessary to ensure dam integrity. New or yet unused spillways shall be placed into operation during the daylight and morning hours when their performance can be effectively monitored by the dam inspectors and waste system operators. Vegetative cover adequate to inhibit wind and water erosion shall be established and maintained on all exposed surfaces of the dam. Such vegetation shall be maintained sufficiently low to permit visual inspection of the soil surfaces in critical areas outlined in rule 62-672.500.

(2) Retired dams- The department shall be notified prior to the retirement of a dam. The vegetative cover on retired dams shall be maintained sufficiently low to permit visual inspection of the soil surfaces in critical areas outlined in rule 62-672.500. In addition, the water level control structures in retired dams shall be adjusted to suit the circumstances of storm drainage requirements as the solids concentrations of the impounded liquids becomes progressively higher. Pools of trapped stormwater and/or clarified wastewater shall be drained away from the upstream face of the dam to the greatest extent possible. A dam shall not be considered as retired so long as pools of free water remain in contact with the dam.

Specific Authority 403.061(22), FS.
Law Implemented 403.061(22), FS.
History Revised 12-8-72. Previously numbered as 17-9.04. Formerly 17-9.040, Formerly 17-672.040, Formerly 17-672.400, Amended 6-28-99.

62-672.500 Inspections.

Personnel or agents of the department may accompany inspectors on any inspection required by this rule, or inspect settling areas at any other time which is reasonable under the circumstances involved. They may also examine any inspection reports and be furnished copies thereof upon request.

(1) A completed new dam shall be thoroughly inspected prior to the deposition of industrial wastes above ground level behind it. Toe drains, spillways and water level control structures shall be certified by the design engineer as meeting all specifications of the design, and degree of compaction of the fill shall also be certified. Legible photographs, either aerial or ground, may be used to document this initial inspection, but shall not in themselves constitute certification. A complete file describing the items inspected and their condition shall be maintained by the owner, and a copy shall be furnished to the department prior to the above-grade deposition of industrial wastes behind the dam.

(2) Active dams shall be inspected weekly unless a defect has been disclosed, in which event the defective area of the dam shall be inspected daily until corrective maintenance has cured such defect. Inspections shall be made by employees of the owner of the dam who have been trained in accordance with rule 62-672.500(9). The findings on each inspection shall be recorded, signed by the inspector, and filed after any necessary corrective action is initiated by supervisory personnel. The inspector shall travel on foot, horseback, or wheeled vehicle suitable for traversing the terrain involved at slow speeds. Dams shall be inspected from the crest and from the toe through the use of all-weather toe roads or other means of direct inspection from the toe of the dam. Items to be noted on weekly (or daily) inspections shall include:

(a) Condition of vegetation on dam and in area for fifty feet (50') downstream from the outside toe.

(b) Piezometric levels within the mass of the dam when instrumentation has been installed.

(c) Condition of soil surfaces on top and slopes of the dam and in area for fifty feet (50') downstream from the outside toe.

(d) Condition of drainage ditches in the area of the base of the dam.

(e) Liquid surface elevation and amount of freeboard. (This is to be recorded daily when limitations could be violated during a week of operations.)

(f) Condition of spillways and water level control structures, including all conduits exiting the dams.

(3) Retired dams shall be inspected monthly by a competent employee of the owner of the dam who has been instructed and tested by a qualified engineer regarding items to be checked. The findings on each inspection shall be recorded, signed by the inspector, and filed after any necessary corrective action is initiated by supervisory personnel. Such inspection shall include:

(a) Condition of soil surfaces on the crest, slopes, and area fifty feet (50') downstream from the dam.

(b) Determination of piezometric levels within the mass of the dam while instrumentation of the dam has been determined to be necessary by an engineer.

(c) Determination of seepage characteristic through analyses of infra-red aerial photographs or thermal imagery when surveillance by such means has been proposed by the owner of the dam and approved by the department.

(d) Condition of Spillway and water level control structures, including all conduits exiting the dam, and any wooden structures which are subject to rotting.

(4) When a critical condition as listed in rule 62-672.500(7) is suspected during a weekly or monthly inspection, the inspector shall ensure that a technical representative of the dam owner is made aware of the condition immediately. If the existence of the critical condition is confirmed, the department shall be notified immediately. A written report of the condition and the actions proposed for its correction shall be made to the department within seven (7) days from the time existence of the critical condition is confirmed.

(5) Each active and each retired dam shall be inspected annually by a third-party engineer who is experienced in the field of construction and maintenance of dams. Costs for such inspections shall be borne by owners of the dams. One copy of the report pertaining to such annual inspections shall be furnished to the department, and the original of the report shall be retained by the owner. These inspections shall include:

(a) Analyses of seepage or other significant items shown on all aerial photographs of the dam which have been taken for any reason since the date of last annual inspection.

(b) Condition of soil surfaces on top and slopes of the dam and in areas for fifty feet (50') downstream from the outside toe.

(c) Review of all weekly, daily and monthly inspection reports to evaluate the effectiveness of maintenance which was done to the dam during the period since the last annual inspection.

(d) Examination and interpretation of data obtained from any instrumentation installed in the mass of the dam.

(e) Condition of spillway and water level control structures, including all conduits exiting the dam and any wooden structures which are subject to rotting. The annual inspection report shall include recommendations and corrective measures taken. If corrective measures are not completed by the time of annual submittal, then follow up inspections shall be conducted by the third-party engineer with quarterly project reports submitted until completion of all corrective measures.

(6) A retired dam which is to be abandoned shall be inspected by an engineer registered in Florida who is competent to determine that no further impoundment is being accomplished by the dam involved and that no further

surveillance or maintenance is required. A copy of the final inspection used by the engineer for making his determination as above shall be furnished to the department, and a copy shall be retained by the owner of the dam. The department shall be notified prior to abandonment of any dam. Costs for such terminal inspections shall be borne by the owners of the dams which are to be abandoned.

(7) Any of the following items shall be considered as indicating a critical condition which requires immediate investigation and may require emergency maintenance action:

(a) Seepage on outer face or downstream from the toe in which there are boils, sand cones or deltas.

(b) Silt accumulations, boils, deltas, or cones in the drainage ditches at dam bases.

(c) Cracking of soil surface on crest or either face of the dam.

(d) Bulging of the downstream face of the dam.

(e) Seepage, damp area, or boils in vicinity of or erosion around a conduit through the dam.

(f) Any subsidence of the crest or faces.

(8) The following items shall be considered as indicating potential trouble areas which should be closely checked on subsequent inspections and repaired as necessary:

(a) Overgrowth patches of vegetation on downstream face or close area downstream from the toe.

(b) Surface erosion, gullying, or wave erosion of the upstream face of the dam.

(c) Surface erosion, gullying or damp areas on the downstream face of the dam, including the berm and the area downstream from the outside toe.

(d) Erosion below any conduit exiting the dam.

(e) Wet areas or soggy soil in downstream face of dam or in natural soil below dam.

(9) The owner of a dam shall provide annual training to all dam inspection personnel by an engineer experienced in dam design, construction, operation and inspection, and shall provide training to all appropriate employees in the implementation of the contingency plan required by rule 62-672.550. The owner shall maintain records documenting such training.

(10) In the event of a dam failure which permits deleterious substances to enter waters controlled by the State or to cause other damages, the chairman of the Environmental Regulation Commission may convene at once a special panel of experts with experience in design and construction of earthen dams from government, industry, private engineering firms and/or educational institutions to gather data and to investigate the cause of the failure and to make recommendations for corrective actions. The owner of a failed dam shall take immediate action to arrest the flow of

deleterious material when such is possible, and shall have the failed area of the dam photographed at the earliest practicable time. If feasible, the owner shall construct a coffer dam upstream from the failed area to impound materials. This will preserve the area of failure for detailed investigation and thus contribute to factual data to be used in future safety considerations.
Specific Authority 403.061(22), FS.
Law Implemented 403.061(22), FS.
History Revised 12-8-72. Previously numbered as 17-9.05. Formerly 17-9.050, Formerly 17-672.500, Amended 6-28-99.

62-672.550 Contingency Plans.
The owner of a dam shall prepare contingency plans to be followed in the event of a dam failure. Each plan shall include mapping showing areas subject to downstream flooding and a notification of local and state officials. The contingency plans shall be maintained on file for review by the department upon request.
Specific Authority: 403.061(22), FS.
Law Implemented: 403.061(22), FS.
History: New 6-28-99.

62-672.570 Non-Clay Phosphate Mining Impoundments.
Each owner of a non-clay phosphate mining impoundment shall implement best management practices for such impoundment in accordance with "BMPs for Non-Clay, Phosphate Mining and Reclamation Berms and Impoundments," dated July 23, 1996, which is adopted and incorporated by reference. Upon request by the department, each such owner shall provide verification of implementation of the foregoing best management practices to representatives of the department's Bureau of Mine Reclamation during quarterly inspections of affected facilities.
Specific Authority: 403.061(22), FS.
Law Implemented: 403.061(22), FS.
History: New 6-28-99.

Part II – Phosphogypsum Stack System Impoundments

62-672.600 Construction of New Perimeter Earthen Dikes.
(1) Design.
(a) Site investigation. The general area desired for construction of a perimeter earthen dike shall be carefully inspected by the design engineer prior to selection of the exact location for the dike. Areas of uneven natural subsidence, sinkholes, pockets of organic matter, or other unstable soils shall be avoided, unless special provisions are made for their mitigation.

(b) Soil testing. The requirements for soil testing set forth in rule 62-672.300 (1) (b) are adopted and incorporated by reference.

(c) Cross section design. The design freeboard of an above-grade perimeter earthen dike shall not be less than five (5) feet unless a design freeboard of less than five (5) feet is justified based on results of seepage and stability analyses and wave run-up analyses. However, in no event shall the design freeboard of an above-grade perimeter earthen dike be less than three (3) feet. The crest on the top of the dike shall be graded toward the inside or the outside slope. If the dike exceeds 10 feet in height and crest runoff is directed toward the outside slope, runoff controls shall be used to protect the outside slope against erosion. Both inside and outside slopes shall be no steeper than two and one-half (2.5) horizontal to one (1.0) vertical. Seepage control shall be provided by means of a liner placed on the inside slope of the dike and constructed in accordance with rule 62-673.400. The top of the dike shall include a roadway which will permit wheeled vehicle traffic at all times. The design of the outermost earthen dike shall also incorporate an all-weather roadway near the downstream toe which will permit wheeled vehicle traffic around the perimeter of the dike for purposes of inspection of the slope, toe and natural ground beyond the toe, as well as maintenance.

(d) Stability analysis. A seepage or flow net analysis shall be made, when applicable, for use in the stability analysis. The stability analysis shall consider the minimum fluid level as well as the fluid level at the design freeboard on the upstream slope of the dike, and possible fluctuations of the tail water level.

(e) Design safety factors. The design safety factors set forth in rule 62-672.300(1)(e) are adopted and incorporated by reference.

(2) Site preparation. The site preparation requirements of rule 62-672.300(2) are adopted and incorporated by reference.

(3) Material to be used. The requirements for materials to be used are set forth in rule 62-672.300 (3) and are adopted and incorporated by reference.

(4) Process water control design. Conveyance ditches and hydraulic structures located within a phosphogypsum stack system shall have adequate capacity to circulate the process water stream(s), if applicable, and to contain or transfer runoff on the watershed upstream of the water control structures resulting from a storm event generating 12 inches of rainfall in 24 hours while maintaining at the same time the design freeboard of the perimeter earthen dike. If provisions are made to contain some or all of the storm surge resulting from such event within the phosphogypsum stack system upstream from the conveyance system or water control structures, then the transfer capacity of the ditches and structures may be reduced accordingly.

(5) Methods of construction.

(a) Each new dike shall be constructed to meet or exceed the minimum safety requirements of the specifications and design for that dike. Appropriate earthmoving equipment shall be used to place materials in dike construction. The soil shall be

compacted and density tests shall be performed to ensure that the designed densities are obtained. A representative of the third-party engineer shall be present on the site during construction of the dike and liner, and during construction and installation of spillways and penetrations through the dike or liner. The department shall be advised of the date on which construction of a new dike will begin so that a department representative can inspect the site.

(b) Areas around any water level control structure pipe, any other conduit, or any surface of discontinuity between materials within the mass of the dike shall be carefully inspected to avoid potential concentration of seepages and to ensure that soils under and around a culvert are uniformly compacted and are in continuous contact with the external culvert surface. All penetrations through the liner on the upstream slope of the dike shall be made using water tight joints or connections and shall be capable of maintaining their integrity under anticipated in-use conditions. All pipes and joints in pipes or conduits extending through a dike shall be made leak proof and shall be constructed of materials suitable for the fluids carried and the load imposed. In order to avoid leaks associated with differential settlement, conduits through dikes shall not be rigidly supported by piles or piers. Backfill around conduits shall be of a density that is equal to or greater than those of the surrounding embankment. Particular attention shall be devoted to the lower third of the conduit.

(6) Documentation. Applicable provisions of the documentation requirements set forth in rule 62-672.300(6) are adopted and incorporated by reference with the following exception. The owner shall furnish a certification of completion of construction within 30 days after completion of the dike. The remaining documents shall be submitted within six (6) months of placing the facility into operation.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.620 Assessment of Existing Perimeter Earthen Dikes.

(1) Within nine months of June 28, 1999, the owner of a phosphogypsum stack system shall submit to the department documentation that existing perimeter earthen dikes have either been:

(a) authorized to be constructed or modified by a permit issued by the department in response to an application that addressed freeboard, dike seepage, factors of safety, and slope stability; or

(b) engineered, or retrofitted such that they are deemed by a third-party engineer to be in compliance with the seepage control feature provision of rule 62-672.300(1)(c), the freeboard provisions of rule 62-672.600(1)(c), and the design factors of safety and slope stability provisions of rule 62-672.600(1)(d) and (e); or

(c) evaluated by a third-party engineer who certifies the safety and stability of the dikes.

(2) Within nine months of a final determination that a dike's safety and stability cannot be so verified, the owner shall submit to the department a proposal to upgrade or retrofit the dike to comply with the requirements of rule 62-672.620(1)(b), or to take the dike out of service as soon as practicable but no later than three (3) years from June 28, 1999. The owner of any such dike shall implement, within nine months of June 28, 1999, interim measures recommended by a third-party engineer that will ensure the safety and stability of the dike until such time as it is upgraded or retrofitted or taken out of service. These interim measures must be submitted to the department.

(3) At the time of the assessment required by rule 62-672.620(1), a third-party engineer shall also determine whether the existing system is equipped with process water conveyance/containment capabilities that conform to the design requirements set forth in rule 62-672.600 (4). Within one year of a final determination that a system does not meet these design criteria, the owner shall submit to the department a proposal to modify the system to attain compliance. Such modification shall be completed as soon as practicable but not later than three years after June 28, 1999 or 18 months after the owner receives all necessary governmental permits or other prior approvals whichever shall later occur.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.650 Operational Requirements for Perimeter Earthen Dikes.

(1) All perimeter earthen dikes shall be operated so as to maintain the design freeboard in accordance with 62-672.600(1)(c) unless temporary incursions into the freeboard are demonstrated to be safe pursuant to rules 62-672.650(2) or 62-672.870. Each perimeter earthen dike shall be inspected as prescribed in rule 62-672.670. Vegetative cover adequate to inhibit wind and water erosion shall be established and maintained on the outside slope of the dike. Such vegetation shall be maintained sufficiently low to permit visual inspection of the soil surfaces and critical areas outlined in rule 62-672.670.

(2) Temporary Nonemergency Use of Design Freeboard.

(a) To assure system safety and integrity or to reduce the probability of discharge, the department shall approve temporary use of the design freeboard of a perimeter earthen dike upon justification by the owner and review of written documentation prepared by a third-party engineer demonstrating that such use can occur while maintaining the safety and stability of the dike. Any department approval shall include as conditions any specific limitations or other requirements recommended by the third-party engineer as necessary to maintain dike integrity and shall establish a specific time limit for such use. The third-party engineer shall base their recommendations on:

1. an inspection of the facility;

2. dike design and construction information;

3. results of seepage and stability analyses (including monitoring of seepage pressures within the dike if such monitoring is deemed necessary); and

4. wind surge and wave run-up analyses.

(b) The report by the third-party engineer shall specify conditions under which such use may be authorized, such as:

1. acceptable wind speeds in forecast;

2. acceptable rainfall levels in the forecast;

3. increased inspection frequencies; and

4. weekly monitoring of piezometric levels within the mass of the dike, if and as needed.

(c) No temporary use of the design freeboard pursuant to this section may be authorized unless the facility either:

1. prior to initiation of such temporary use has storage capacity adequate to contain a storm event generating 12 inches of rainfall in 24 hours below the design freeboard fluid level; or

2. such action has been approved by the department under an action plan submitted pursuant to rule 62-672.780(8).

(d) Fluctuation in freeboard shall not result in activation of emergency overflow spillways.

(e) Changes in water levels during such temporary use shall not be deemed to reach any of the triggers established under 62-672.780.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.670 Inspection and Maintenance Requirements For Perimeter Earthen Dikes.

(1) Personnel or agents of the department may accompany inspectors on any inspection required by this rule, or inspect perimeter earthen dikes at any other time which is reasonable under the circumstances involved. They may also examine any inspection reports and be furnished copies thereof upon request.

(2) A completed new perimeter earthen dike shall be thoroughly inspected prior to the placement of process water behind it. Spillways and water level control structures shall be certified by the design third-party engineer as meeting all specifications of the design, and degree of compaction of the fill shall also be certified. Legible photographs, either aerial or ground, may be used to document this initial inspection, but shall not in themselves constitute certification. A complete file describing the items inspected and their condition shall be maintained by the owner, and a copy shall be furnished to the department for approval prior to the deposition of process water behind the dike.

(3) All perimeter earthen dikes and water control structures shall be inspected weekly unless a critical condition listed in rule 62-672.670(6) has been disclosed, in which event the defective area of the dike shall be inspected daily until corrective maintenance has cured such defect. Water level elevations and freeboard compliance shall be determined at least every 12 hours. Piezometric water levels within the dike shall be measured quarterly if piezometers have been installed. The inspections shall be made by a qualified company employee or contractor employed or retained by the owner of the dike which employee or contractor has been trained in accordance with rule 62-672.800. The findings of each inspection shall be recorded in a log which log shall be made available to the department upon request.

(4) When a critical condition listed in rule 62-672.670(6) is suspected during an inspection, the inspector shall ensure that a technical representative of the dike owner is made aware of the condition immediately. If the existence of the critical condition is confirmed, the department shall be notified immediately. A written report of the condition and the actions proposed for its correction shall be made to the department within seven (7) days from the time existence of the critical condition is confirmed.

(5) Each perimeter earthen dike shall be inspected annually by a third-party engineer with experience in the field of construction and operation of perimeter earthen dikes. One copy of the report pertaining to such an inspection shall be furnished to the department, and the original report shall be retained by the owner. These inspections shall include:

(a) Analyses of seepage or other significant items shown on all aerial photographs of the dike which have been taken for any reason since the date of the last annual inspection.

(b) Condition of soil surfaces and top and slopes of the dike and in areas for fifty feet (50') downstream from the outside toe.

(c) Review of all periodic inspection reports to evaluate the effectiveness of maintenance which was done to the dike during the period since the last annual inspection.

(d) Examination and interpretation of data obtained from any instrumentation installed in the mass of the dike.

(e) Condition of spillway and water level control structures, including all conduits exiting the dike.

The annual inspection report shall include recommendations and corrective measures taken. If corrective measures are not completed by the time of annual submittal, then follow up inspection shall be conducted by the third-party engineer with quarterly project reports submitted until completion of all corrective measures.

(6) Any of the following items shall be considered as indicating a critical condition which requires immediate investigation and may require emergency maintenance action:

(a) Concentrated seepage on the downstream slope, at the toe of slope, or downstream from the toe of slope (e.g., boils, soil cones, springs or deltas).

(b) Evidence of slope instability including sloughing, bulging or heaving of the downstream slope, or subsidence of the dike slope or crest.

(c) Cracking of surface on crest or either face of the dike.

(d) General or concentrated seepage in the vicinity of or around any conduit through the dike.

(e) Observed or suspected damage to the liner system.

(7) The following items shall be considered as indicating potential trouble areas which should be closely checked on subsequent inspections and repaired as necessary:

(a) Abnormal dead vegetation or damp areas on the downstream slope, at the toe of slope, or downstream from the toe of slope that could be indicative of pond water seepage.

(b) Surface erosion, gullying or wave erosion on the upstream slope of the dike.

(c) Surface erosion or gullying on the downstream slope of the dike.

(d) Erosion below any conduit through the dike near or at the toe of slope of the dike.

(8) All logs and reports required under this section shall be retained by the owner of the phosphogypsum stack system for a period of not less than three years from the date of the last entry in the log or from the date of the report.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.700 Construction of New Phosphogypsum Stacks.

(1) Any new phosphogypsum stack or lateral expansion thereof as defined in rule 62-673.200(9) shall be designed in accordance with the minimum standards of rule 62-673, F.A.C., with an overall factor of safety of 1.5 for any potential failure surface encompassing the impoundment on top of the stack and passing through the gypsum slope or bottom liner interfaces, or extending into earthen material in contact with the bottom liner.

(2) The maximum height of a starter dike for new phosphogypsum stacks or lateral expansions thereof shall be equal to or lower than the height of the associated lined perimeter dike.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.720 Assessment Of Existing Phosphogypsum Stacks.

(1) Within nine months of June 28, 1999, the owner of an existing phosphogypsum stack for which a closure permit has not been issued shall provide to the department documentation that the stack has either been:

(a) authorized to be constructed by a permit issued by the department in response to an application that addressed stack stability; or

(b) evaluated by a third-party engineer who certifies the safety and stability of the stack.

(2) Within nine months of a final determination that the stability of a stack or stack compartment cannot be so verified the owner shall submit to the department a proposal to upgrade or retrofit the stack or stack compartment to assure safety and stack stability or to develop and implement revised operating procedures that will assure safety and stability. The owner of any such stack shall implement, within nine months of June 28, 1999, interim measures recommended by a third-party engineer that will ensure the safety and stability of the stack or stack compartment until such time as it is upgraded or retrofitted or is made subject to revised operating procedures. These interim measures must be submitted to the department.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.750 Procedures For Raising Phosphogypsum Stacks.

Phosphogypsum stacks shall be raised in accordance with the following minimum standards:

(1) The crest width of each gypsum dike shall not be less than eighteen (18) feet.

(2) When constructing a gypsum dike, the thickness of each gypsum lift shall not exceed five (5) feet.

(3) The overall average exterior slope of the phosphogypsum stack shall be established based on the results of stability analyses previously performed by a third-party engineer to demonstrate or certify the safety and stability of the stack throughout the life of the stack. The overall average exterior slope of the phosphogypsum stack shall be no steeper than two (2.0) horizontal to one (1.0) vertical for stacks greater than 50 feet in height.

(4) Except as provided in rule 62-672.750(5), sufficient lengths of the inboard dike, levee, or windrow used to create a rim ditch shall be maintained at a lower elevation than the crest of the associated gypsum dike so that the rim ditch will always discharge inward into a stack settling compartment.

(5) The fluid level in the rim ditch shall not be allowed to rise above the crest elevation of the gypsum dike in the vicinity unless site specific provisions or precautionary measures specifically outlined in the operation plan referred to in rule

62-672.780 are implemented. In no case shall the water level in the settling compartment be allowed to rise above the crest of the gypsum dike.
Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.760 Procedures For Decanting Process Water From Top Of Phosphogypsum Stack.

The owner of a phosphogypsum stack system, including inactive stacks or temporarily inactive stacks, shall comply with the following requirements for decanting process water from the top of phosphogypsum stacks.

(1) One or more of the following three methods may be used to decant water from the top of a phosphogypsum stack:

(a) overflow broad crested weir dug in gypsum, such as controlled flow through an open cut;

(b) decant pipe placed in a backfilled cut; or

(c) siphon line or positive pressure line that does not penetrate the gypsum dike.

Any exception to the above shall be specifically recommended, on a case-by-case basis, by a third-party engineer and approved by the department upon a demonstration that such exception will maintain the integrity of the impoundment. Any exception to the requirements specified in rules 62-672.760(2)-(14) shall be specifically recommended, on a case-by-case basis, by a third-party engineer and the department shall be notified of the exception in a timely manner.

(2) The maximum depth of any open cut used to decant water and any cut made to place or remove a decant pipe shall be limited to no more than 10 feet. The depth of cut shall be measured from the top of the fluid level elevation in the rim ditch at the decant location, i.e., from the maximum elevation of the slurry flowing in the rim ditch at any time prior to making the cut. The depth shall be measured to the bottom invert elevation of the decant pipe or open cut beneath the centerline of the gypsum dike.

(3) Each facility shall select a range of bottom widths and side slopes for any cut to be made that are consistent with the site-specific decanting and backfilling procedures adopted by that facility.

(4) The minimum distance from the decant location (within the settling compartment on top of the stack) to the outer edge of any cut on the exterior slope of the stack, measured along the invert of the cut, shall be no less than 40 feet. Moreover, if the distance from the decant location to the outer edge of the cut on the exterior slope is less than 55 feet, either one of the following additional precautionary measures shall be implemented:

(a) the cut made across the inner levee (upgradient from the rim ditch) shall be offset at least 15 feet relative to the cut made across the gypsum dike crest; or

(b) a gypsum "beach" or delta shall be placed or built into the inner settling compartment at the decant location prior to making the cut.

(5) The invert of any cut through a gypsum dike shall be located in material that has been allowed to consolidate and age for no less than 2 weeks.

(6) The centerline of a new decant cut shall be offset a minimum distance of 50 feet from the location of the most recently backfilled cut (i.e., older cut which is no longer being used to decant water).

(7) If an open cut is used to decant water, the depth of water over the broad-crested weir opening shall be controlled at less than 2 feet. If a decant pipe is used, the diameter of the pipe shall be no greater than 30 inches, and the pressure rating of the pipe shall be no less than 50 psi (e.g., for High Density Polyethylene (HDPE) pipes, the Standard Dimension Ratio (SDR) shall be no greater than 32.5; and for Polyvinyl Chloride (PVC) pipes, the pipe Schedule shall be equal to or greater than 40) . Moreover, the horizontal section of any decant pipe placed in a backfilled trench shall be extended no less than 2 feet and no more than 5 feet beyond the edge of the cut on the exterior slope of the stack, or the discharge end of the pipe shall be laid along the exterior slope of the stack.

(8) Additional measures for decant pipe.

(a) If a decant pipe is used, and a cut is made to place or remove the pipe, the following precautionary measures shall be implemented prior to making the cut:

1. place a gypsum "beach" or delta into the inner settling compartment extending no less than 30 feet from the inside edge of crest of the inner levee, then lower the water level in the settling compartment below the bottom invert elevation of the decant pipe, and construct a temporary cofferdam on the gypsum beach as an added safety measure; or alternatively,

2. place a gypsum "beach" or delta into the inner settling compartment extending no less than 100 feet from the inside edge of crest of the inner levee, temporarily isolate the compartment where the decant is located to prevent the introduction of additional water or slurry, and construct a temporary gypsum cofferdam as needed to isolate the decant location. The cofferdam shall have a minimum crest width of 20 feet. The excavation shall not be allowed to extend across an imaginary 3.0 Horizontal : 1.0 Vertical line projected from the outside toe of the cofferdam towards the exterior slope of the stack; or alternatively,

3. place a gypsum "beach" or delta into the inner settling compartment extending no less than 500 feet from the inside edge of crest of the inner levee, and temporarily isolate the compartment where the decant is located to prevent the introduction of additional water or slurry.

(b) Once the excavation has progressed below the water level elevation in the settling compartment, the cut shall be completed and the excavation backfilled as expeditiously as possible but no later than within 48 hours.

(9) Prior to backfilling a cut, the exposed gypsum surface shall be scarified (e.g., with the dozer tracks or with the backhoe bucket) as needed to break up and remove any cemented surface crust, if present.

(10) Only moist or wet gypsum may be used in backfilling operations. Dry gypsum shall not be used unless it is moisture-conditioned prior to or during placement. Moreover, gypsum used in backfilling a decant cut shall have an equivalent texture and consistency to freshly sedimented gypsum excavated from the rim ditch.

(11) Backfilling operations shall incorporate one or more of the following construction steps or procedures, as applicable, or other methods certified as equivalent by a third-party engineer.

(a) Any open cut through the gypsum dike shall be backfilled with wet or moist gypsum placed in lifts not exceeding 18 inches in thickness, as needed to ensure that the gypsum backfill is in intimate and complete contact with the sides of the cut and with the external surface of the decant pipe, when present.

(b) Either tracked equipment (e.g., dozer) shall be used to roll the surface and compact each lift of moist to wet gypsum, scarifying between lifts as needed; or the bucket of a hydraulic excavator (backhoe) shall be used to place and tamp wet to very wet (e.g. , "sluiced" or flowable) gypsum, having a saturated paste consistency, in lifts, scarifying between lifts as needed. The latter method is suited for use in filling all around a decant pipe, when present, provided the pipe is restrained and prevented from being uplifted during any such filling operation.

(c) Construction equipment shall not be allowed to travel directly over any buried decant pipe until a gypsum cover thickness sufficient to prevent damage to the pipe has been placed over the pipe (as approved by a registered professional engineer).

(d) If saturated gypsum has been used in backfilling a cut through the gypsum dike (i.e., wet to very wet gypsum placed and tamped with the bucket of a hydraulic excavator), then the freshly backfilled plug shall be allowed to set for at least 48 hours before the remainder of the cut inboard of the restored outer dike is backfilled with gypsum slurry via the rim ditch, and before water is allowed to flow in the rim ditch across the backfilled cut.

(12) Backfilling of any decant cut through the gypsum dike shall be done during daylight hours only (unless the entire work area is well lighted); and shall be inspected and monitored by a qualified company employee familiar with the specified backfilling procedures.

(13) The placement in service and initial operation of the rim ditch adjacent to any backfilled cut shall be inspected and monitored by a qualified company employee, with periodic monitoring to continue at least once every 12 hours during the first 36

hours after re-activating the area adjacent to the cut. Any of the following items shall be considered as indicative of a potentially critical condition requiring immediate notification of supervisory personnel and performance of more frequent inspections until the situation has stabilized or remedial action has been implemented: concentrated seepage on the outer face of the backfilled cut, any sign of sediment transport, cracking or subsidence of the exposed surface on the crest and downstream face, and concentrated seepage or boils in the vicinity of a decant pipe.

(14) All inspections shall be documented in writing and the findings shall be recorded, signed by the qualified company employee who conducted the inspection and maintained at the facility for a period of not less than three years.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.770 Phosphogypsum Stack Inspection And Maintenance.

(1) Personnel or agents of the department may accompany inspectors on any inspection required by this rule, or inspect starter dikes or gypsum dikes at any other time which is reasonable under the circumstances involved. They may also examine any inspection reports and shall be furnished copies thereof upon request.

(2) A completed new phosphogypsum stack system, including the starter dike, shall be thoroughly inspected prior to the deposition of process water in it. The liner, spillways and water level control structures shall be certified by the design third-party engineer as meeting all specifications of the design, and the degree of compaction of the fill shall also be certified. Legible photographs, either aerial or ground, may be used to document this initial inspection, but shall not in themselves constitute certification. A complete file describing the items inspected and their condition shall be maintained by the owner, and a copy shall be furnished to the department.

(3) All stack compartments, including any noted areas containing critical conditions as listed in rule 62-672.770(6) until corrected, shall be inspected daily. Stack slopes, collection ditches, and drain outlets shall be inspected weekly. Flow from drain outlets shall be checked quarterly. The total areal coverage of water on the stack shall be estimated each month and the total water inventory on top of the stack shall be estimated annually. The required inspections and estimates shall be carried out by a qualified company employee or contractor employed or retained by the owner of the phosphogypsum stack which employee or contractor has been trained in accordance with rule 62-672.800. The results of the required inspections and estimates shall be recorded in a log which shall be maintained by the owner of the phosphogypsum stack and made available to representatives of the department upon request.

(4) When a critical condition listed in rule 62-672.770(6) is suspected during an inspection, the inspector shall ensure that a competent technical representative of

the phosphogypsum stack system owner is made aware of the condition immediately. If the existence of the critical condition is confirmed, the department shall be notified immediately. A written report of the condition and the actions proposed for its correction shall be made to the department within seven (7) days from the time existence of the critical condition is confirmed.

(5) Each phosphogypsum stack shall be inspected annually by a third-party engineer with experience in the field of construction and operation of phosphogypsum stacks at the same time that the annual inspection of the associated perimeter earthen dike occurs as required by rule 62-672.670. One copy of the report pertaining to such an inspection shall be furnished to the department, and the original report shall be retained by the owner. The report shall include an updated aerial photograph and shall state the area of the top of the stack and the current height and elevation of the stack. The annual inspection report shall include recommendations and corrective measures taken. If corrective measures are not completed by the time of annual submittal, then follow up inspections shall be conducted by the third-party engineer on a quarterly basis with quarterly project reports submitted until completion of all corrective measures.

(6) Any of the following items shall be considered as indicating a critical condition which requires immediate investigation and may require emergency maintenance action:

(a) Concentrated seepage (e.g. , springs or boils) on the face of a stack slope, at the toe of the slope, or beyond the toe of slope with active signs of piping at the point of seepage (e.g., a gypsum or soil cone or delta at the point of seepage).

(b) Evidence of slope instability including sloughing, bulging or heaving of the face of the stack or the toe of the slope.

(c) Lateral movement or subsidence of the slope or crest of the stack.

(d) Formation of new non-shrinkage cracks or enlargement of wide cracks in the surface of the slope or crest of the stack.

(e) Observed or suspected damage to the liner system.

(f) Drains discharging turbid water.

(g) Concentrated seepage (i.e. , springs or boils) in the vicinity of a decant pipe.

(7) The following items shall be considered as indicating potential trouble areas which should be closely checked on subsequent inspections and repaired as necessary:

(a) Concentrated seepage (e.g. , springs or boils) on the face of a stack or at the toe of slope without active signs of piping at the point of seepage.

(b) Previously observed localized sloughing at the toe of slope of the stack.

(c) Previously observed cracks in the surface of the slope or crest of the stack.

(d) Nonflowing drains.

(8) All logs and reports required under this section shall be retained by the owner of the phosphogypsum stack system for a period of not less than three years from the date of the last entry in a log or from the date of the report.
Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.780 Phosphogypsum Stack System Operation Plans.
The following items shall be included in the operation plan for each phosphogypsum stack system and shall be approved by an engineer experienced in the construction and operation of phosphogypsum stacks:

(1) The method used to raise and operate the stack.

(2) A description of the source and consistency of gypsum used in constructing the gypsum dikes and the method used for shaping and/or rolling the gypsum.

(3) The overall average exterior slope for raising the phosphogypsum stack and the maximum design height of the stack.

(4) The procedures used to assure that pipes used to transport phosphogypsum to the phosphogypsum stack systems and to return process water to the phosphate fertilizer production facilities are operated and maintained in a safe manner.

(5) The procedures used to decant process water from the top of the phosphogypsum stack.

(6) The location of pumps, spillways, and staff gauges.

(7) Provisions that address emergency measures to be taken in the event of mechanical failure of a pump or in the event of a power failure for any portion of a phosphogypsum stack system that relies on pumps or power to operate monitoring equipment or to transfer process water and/or rainfall-runoff from low areas to the main cooling pond. Such emergency provisions may include:

(a) back-up power (e.g., on-site power; diesel generator, etc.) and/or back-up pump which would be activated in the event of electrical or mechanical failure; or

(b) sufficient surge storage capacity or emergency surge capacity within the conveyance system to contain the process water stream(s) , if applicable, as well as runoff from a storm event generating 12 inches of rainfall in 24 hours; or

(c) increased inspection frequencies or continuous monitoring (e.g., remote video camera or automatic water level control device tied to a warning system) to provide early warning of an imminent spill prior to its occurrence; and an emergency action plan that would be undertaken to prevent or contain an accidental spill.

(8) A site-specific water management plan updated annually to reflect changes in watershed area and storm surge.

(a) Each plan shall specify a set of specific actions that are put into motion when certain "triggers" are exceeded in the cooling/surge pond system. Each trigger shall correspond to the storage volume or operating water level(s) needed to contain the storm surge (or a fraction of the storm surge) in the system from a specific design storm (e.g., 12 inches in 24 hours, or the 25-year/24-hour event) . If provisions are made to contain the direct rainfall quantity from a storm event generating 12 inches of rainfall in 24 hours in the settling compartments atop the phosphogypsum stack, then the top area of the stack need not be considered in calculating the watershed of the cooling/surge pond system and corresponding storm surge capacity.

1. For facilities that do not have sufficient emergency surge storage capacity to contain a storm event generating 12 inches of rainfall in 24 hours within a department-approved emergency holding pond (EHP), the trigger levels in the cooling/surge pond system shall include:

a. The "action plan" trigger corresponding to the storage volume or operating water level (s) required to contain the rainfall quantity from a storm event generating 12 inches of rainfall in 24 hours. When this level is exceeded for 72 consecutive hours, the owner of the system shall contact the department and present for the department's review a site specific action plan (or refer the Department to a previously submitted site-specific action plan) for process water inventory management and/or consumption.

b. The "may treat" trigger corresponding to the storage volume or operating water level (s) required to contain the 25-year/24-hour storm event. When this trigger is exceeded for 48 consecutive hours, the owner of the system shall notify the department on the next working day and begin implementing activities needed for activating any permitted treatment station(s), or, alternatively, the owner shall undertake actions to increase the available surge storage capacity within the process system which could include reductions in the volume of water reporting to the process water system. The initiation of process water treatment and discharge at this level by facilities that have a department permit to discharge is optional.

c. The "must treat" trigger corresponding to the storage volume or operating water level(s) required to contain one half of the 25-year/24-hour storm event. When this level is reached or exceeded, the owner of the system for which the department has issued a discharge permit shall notify the department in writing by facsimile within 24 hours and begin treatment of process water for reuse or discharge.

2. For facilities that have a department-approved EHP, the storage capacity of the EHP shall be taken into account in establishing the "action plan," "may treat," and "must treat" triggers. When process water is released into the EHP, the owner of the system shall notify the department within 24 hours and immediately begin implementing all measures needed to consume, remove or treat the water from the temporary emergency storage area within the time frame authorized under applicable provisions of rule 62-673.200(15), F.A.C.

(b) Each facility's water management plan shall be site-specific and shall be based on a water balance analysis performed annually which considers occurrence of the 100-year monthly rainfall during September, and total precipitation of 65 inches for the calendar year.

(c) Each facility must maintain records to identify the various "trigger" levels. This record should contain as a minimum a site-specific water balance summary sheet which includes the following elements:

1. water levels in each impoundment area;
2. operating levels and trigger levels of each impoundment area;
3. acreage of each impoundment area;
4. acreage of watershed that contributes to the impoundment area; and
5. available storage capacity at the various operation levels, in inches and acre feet.

Each facility shall also regularly monitor water levels as required elsewhere by this rule as well as be able to demonstrate the water levels and available storage capacity at any time upon the request of the department.

(9) The adequacy of the facility's site-specific action plan and emergency measures shall be based on a five-year water balance analysis which shall be rechecked at five year intervals. The water balance calculations shall be performed for the 5-year period using input rainfall quantities which shall include the 100-year September rainfall, the 100-year annual rainfall, and multi-year rainfall events that have an equivalent probability for not being exceeded during the 5-year period. The annual rainfall quantities shall be distributed amongst the various months, where applicable, in proportion to the long term normal monthly rainfalls. For any facility that has been issued a department permit authorizing the discharge of process water to surface waters of the state and that cannot demonstrate that the storage volume will remain below the "must treat" trigger in such a water balance analysis, the owner shall provide reasonable assurance that treatment systems are in place that will operate at a rate that will avoid overtopping of the perimeter dike, provided, however, that for inactive or temporarily deactivated phosphogypsum stack systems, alternate methods to comply with the intent of this rule may be proposed for department approval. The department shall approve the alternate method for inactive or temporarily deactivated phosphogypsum stack systems upon a demonstration that such method will prevent overtopping of the perimeter dike. Any additional treatment capacity necessary to meet the terms of this rule shall be installed within three years of the effective date of this rule or within 18 months of receipt by the owner of all necessary permits or other prior approvals whichever occurs later.

(10) The operation plan for each phosphogypsum stack system shall be modified to comply with all of the provisions of this section by no later than January 1, 2000.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.800 Training.

The owner of a phosphogypsum stack system shall provide annual training in inspection and operations requirements and contingency plan requirements to appropriate personnel. Newly hired personnel shall receive training prior to engaging in inspection or operations activities addressed by this rule. A training plan consistent with the requirements of this section shall be maintained at each facility and be available for inspection by the department upon request. Records demonstrating that appropriate personnel have received the necessary training shall be maintained by the facility owner for a period of three years.
Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.850 Contingency Plans.

The owner of a phosphogypsum stack system shall prepare, by January 1, 2000, and update annually thereafter, a contingency plan to address unplanned releases of process water. The elements of such a plan shall address the applicable elements of the "National Response Team's Integrated Contingency Plan Guidance [61 Fed. Reg. 28,641 (June 5, 1996)] which is incorporated herein by reference and shall demonstrate the ability to mobilize equipment and manpower to respond to emergency situations. The plan shall be maintained at the facility and be available for inspection by the department upon request.
Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

62-672.870 Emergency Measures.

(1) Temporary use of the design freeboard.

(a) Temporary use of the design freeboard of a perimeter earthen dike is authorized when the water level is at the design freeboard and when such use is necessary to prevent the release of untreated process water. Such use of the freeboard shall only be allowed when a third-party engineer has approved such use and when documentation demonstrating the continued safety and stability of the dike is submitted to the department. Such documentation shall include a listing of any operational limitations or constraints recommended by the third-party engineer as set forth in this section together with confirmation that the owner will comply with such recommendations. The third-party engineer shall base their recommendations on:

1. an inspection of the facility;
2. dike design and construction information;
3. results of seepage and stability analyses (including monitoring of seepage pressures within the dike if such monitoring is deemed necessary); and
4. wind surge and wave run-up analyses.

(b) The report by the third-party engineer shall specify conditions under which such use may be undertaken so as not to jeopardize the integrity of the dike, such as:

1. acceptable wind speeds in forecast;
2. increased inspection frequencies; and
3. weekly monitoring of piezometric levels within the mass of the dike, if and as needed.

(c) The third-party engineer shall reevaluate the facility each time such action is proposed by the owner. The department shall be informed of the proposed use and the engineer's recommendations prior to or within 24 hours of each such occurrence.

(2) If the perimeter earthen dike of the phosphogypsum stack system is an above-grade earthen dike, the system may incorporate an emergency spillway to allow for the controlled release of process water during emergencies and avoid overtopping of the perimeter earthen dike. The spillway shall be located so as to minimize the environmental impact of any release to the extent practicable. This provision shall not be deemed to authorize a discharge from the spillway and shall not be construed to limit the department's exercise of its enforcement discretion in the event that such discharge causes or contributes to a violation of applicable department rules.

(3) Notwithstanding any provision of rule 62-673, the department is authorized to allow the temporary use of unlined emergency diversion impoundments to receive and store discharges of process water through a spillway authorized by rule 62-672.870(2) or by pumping to avoid infringement of the design freeboard where such action will avoid or reduce the discharge of process water to surface waters of the state. Following any such discharge, the owner of the system shall initiate all steps reasonably necessary to remove the process water from the unlined emergency diversion impoundment as expeditiously as practicable. Any department approval under this section or any other department approval of measures designed to mitigate impacts of emergency discharges of process water shall not be construed to limit the department's exercise of its enforcement discretion in the event that such measures cause or contribute to a violation of applicable department rules.

Specific Authority: 403.4155, FS.
Law Implemented: 403.4155, FS.
History: New 6-28-99.

Regs apply to facilities started after 3/25/93

CHAPTER 62-673
PHOSPHOGYPSUM MANAGEMENT

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62-673.100 Intent.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.100, Repealed 1-16-97.

62-673.200 Definitions.

The following words, phrases or terms as used in this chapter, unless the context indicates otherwise, shall have the following meaning:

(1) "Aquifer" means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells, springs or surface water.

(2) "Closing" means the time at which a phosphogypsum stack system ceases to accept wastes, and includes those actions taken by the owner or operator of the facility to prepare the system for any necessary monitoring and maintenance after closing.

(3) "Closure" means the cessation of operation of a phosphogypsum stack system and the act of securing such a system so that it will pose no significant threat to human health or the environment. This includes closing, long-term monitoring, maintenance and financial responsibility.

(4) "Department" means the State of Florida Department of Environmental Protection.

(5) "Disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste into or upon any land or water so that such solid waste or any constituent thereof may enter other lands or be emitted into the air or discharged into any waters, including groundwaters, or otherwise enter the environment.

(6) "Facility" means all contiguous land and structures, other appurtenances and improvements on the phosphate fertilizer manufacturing complex.

(7) "Final cover" means the materials used to cover the top and sides of a phosphogypsum stack upon closure.

(8) "Geomembrane" means a low-permeability synthetic membrane used as an integral part of a system designed to limit the movement of liquid or gas in the system.

(9) "Lateral expansion" means the expansion, horizontally, of phosphogypsum or process wastewater storage capacity beyond the permitted capacity and design dimensions of the phosphogypsum stack, or cooling ponds, surge ponds, and perimeter drainage conveyances at an existing facility. Any phosphogypsum stack, cooling pond, surge pond, or perimeter drainage conveyance which is constructed within 2000 feet of an existing phosphogypsum stack system, measured from the edge of the expansion

nearest to the edge of the footprint of the existing phosphogypsum stack system, is considered a lateral expansion.

(10) "Leachate" means liquid that has passed through or emerged from phosphogypsum.

(11) "Liner" means a continuous layer of low permeability natural or synthetic materials which controls the downward and lateral escape of waste constituents or leachate from a phosphogypsum stack system.

(12) "100-year floodplain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

(13) "Phosphogypsum" means calcium sulfate and byproducts produced by the reaction of sulfuric acid with phosphate rock to produce phosphoric acid. Phosphogypsum is a solid waste within the definition of Section 403.703(13), F.S.

(14) "Phosphogypsum stack" means any defined geographic area associated with a phosphoric acid production facility in which phosphogypsum is disposed of or stored, other than within a fully enclosed building, container or tank.

(15) "Phosphogypsum stack system" means the phosphogypsum stack (or pile, or landfill), together with all pumps, piping, ditches, drainage conveyances, water control structures, collection pools, cooling ponds, surge ponds and any other collection or conveyance system associated with the transport of phosphogypsum from the plant to the phosphogypsum stack, its management at the stack, and the process wastewater return to the phosphoric acid production or other process. This definition specifically includes toe drain systems and ditches and other leachate collection systems, but does not include conveyances within the confines of the fertilizer production plant or existing areas used in emergency circumstances caused by rainfall events of high volume or duration for the temporary storage of process wastewater to avoid discharges to surface waters of the state, which process wastewater shall be removed from the temporary storage area as expeditiously as possible not to exceed 120 days after each emergency

(16) "Process wastewater" means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product, along with any leachate or runoff from the phosphogypsum stack system. This term does not include contaminated nonprocess wastewater as that term is defined in 40 CFR 418.11(c).

(17) "Shallow water supply well" means any potable water well which pumps water from an unconfined water table aquifer.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.703, 403.707, FS.
History -- New 3-25-93, Formerly 17-673.200.

62-673.220 Applicability.

(1) The provisions of this chapter apply to new phosphogypsum stack systems or lateral expansions of existing phosphogypsum stack systems for which a complete permit application or request for modification of an existing permit is submitted after March 25, 1993.

(a) Except for incidental deposits of phosphogypsum entrained in the process wastewater, placement of phosphogypsum outside the phosphogypsum stack footprint is considered a lateral expansion of the phosphogypsum stack system. The footprint is defined as the outside edge of the starter dikes used to contain the placement of phosphogypsum in the stack.

(b) Storage or containment of process wastewater outside the footprint of the phosphogypsum stack, cooling ponds, surge ponds, or perimeter drainage conveyances existing on March 25, 1993, is considered a lateral expansion of the phosphogypsum stack system. The footprint is defined as the outside edge of the dams, dikes or ditches used to store or contain process wastewater.

(2) Rule 62-673.500, F.A.C., shall also apply to existing active facilities after March 25, 1993, at the time of permit renewal, or upon issuance of a temporary operating permit.

(3) Rules 62-673.600 - .650, F.A.C., apply to all phosphogypsum stack systems, whether planned, active, or inactive as described in Rule 62-673.600(1), F.A.C.

(4) Lateral expansions of phosphogypsum stack systems are considered existing installations as defined in Chapter 62-522, F.A.C.

(5) Notwithstanding the provisions of paragraph (1)(a) of this section, placement of phosphogypsum into an existing process wastewater area located adjacent to and extending to no more than 350 feet from the edge of the footprint of an existing phosphogypsum stack is not considered a lateral expansion if:

(a) By June 25, 1993, the owner or operator of the phosphogypsum stack system submits to the Department an application for a construction permit for the additional placement area which demonstrates that such placement will not result in a violation of applicable Department ground water standards or criteria;

(b) By June 25, 1993, the owner or operator of the phosphogypsum stack system submits to the Department an application, which includes detailed design features, for a permit to construct a new lined cooling pond which meets the design requirements of Rule 62-673.400, F.A.C., and this cooling pond is constructed within two years of the issuance of the construction permit; and

(c) No phosphogypsum is placed in any unlined area after March 25, 2001.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, F.S.
History -- New 3-25-93, Formerly 17-673.220.

62-673.300 Prohibitions.

(1) No person shall dispose of, or store prior to disposal, any phosphogypsum except within a phosphogypsum stack system permitted by the Department in accordance with this Chapter. This provision shall not be construed to prohibit any use or reuse of phosphogypsum not otherwise prohibited by law.

(2) Material subject to the licensure requirements of Chapter 404, F.S., and Chapter 10D-91, F.A.C., shall only be placed on a phosphogypsum stack in accordance with the terms of that license issued by the Department of Health and Rehabilitative Services.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, 403.708, FS.
History -- New 3-25-93, Formerly 17-673.300.

62-673.310 Alternate Procedures and Requirements.

(1) Any person subject to the provisions of this chapter may request in writing a determination by the Department that a procedure or requirement shall not apply, and shall request approval of alternate procedures or requirements.

(2) The request shall set forth at a minimum the following information:

(a) The specific facility or site for which an exception is sought;

(b) The specific procedures or requirements from which an exception is sought;

(c) The basis for the exception;

(d) The alternate procedure or requirement for which approval is sought and a demonstration that this alternate procedure or requirement provides an equal degree of protection for the public and the environment; and

(e) A demonstration of the effectiveness of the proposed alternative procedure or requirement.

(3) The department shall authorize by order each alternative procedure or requirement approved for an individual facility or site in accordance with this section or shall deny by order the request for such approval.

(4) Requests for alternate procedures or requirements shall be accompanied by a fee of $2000 in accordance with Rule 62-4.050(4)(m)4., F.A.C. Requests must be submitted to the Director of Water Facilities, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.310.

62-673.320 Permitting of Phosphogypsum Stack Systems.

(1) No phosphogypsum stack system shall be constructed, operated, expanded, modified or closed without an appropriate and currently valid permit issued by the Department in accordance with this Chapter. Facilities operating without a permit on March 25, 1993, shall, within 180 days, apply for a temporary operating permit from the Department.

(2) Permit application. The person making application for a permit for a phosphogypsum stack system shall submit to the respective Department district office having jurisdiction where the facility is located a minimum of four copies each of a permit application, engineering plans, and all supporting data and reports for the proposed construction, operation, or closure of the facility prepared by a professional engineer registered in the State of Florida in accordance with provisions of Chapter 471, F.S. Said engineer or another registered professional engineer shall be required to make periodic inspections during construction of the facility to ensure that design integrity is maintained.

(3) Preparation of application. The application for a permit shall be prepared and signed by the applicant on Form 62-673.900(1), Application for Permit to Construct/Operate a Phosphogypsum Stack System, effective 3-25-93, which is adopted and incorporated herein by reference. This form may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400. The application shall include all information necessary for the Department to make an evaluation of the proposed facility to ensure that it will pose no significant threat to public health or the environment. The permit application and supporting information shall include the following.

(a) A letter of transmittal to the Department.

(b) A table of contents listing the main sections of the application.

(c) The permit fee specified in Rule 62-4.050, F.A.C., in check or money order payable to the Department.

(d) Engineer and/or geologist seal. Where required by Chapters 471 or 492, F.S., data presented in support of the application shall be signed and sealed by the professional engineer or professional geologist who prepared or approved the data.

(e) All construction, operation, closure, and ground water monitoring plans, data, drawings, photographs, and reports to support the application.

(f) All maps, plan sheets, drawings, isometrics, or cross-sections to support the application, which shall be legible and:

1. Signed and sealed by the registered professional engineer responsible for their preparation. Wherever possible drawings should be no larger than 24 by 36

inches, folded to 9 by 12 inches. Illustrations, tables or drawings reduced in size should be no smaller than 8 1/2 by 11 inches;

2. Of appropriate scale to show clearly all required details;

3. Numbered, referenced to the narrative, and titled, with a legend of symbols used, horizontal and vertical scales (where applicable), and drafting or origination dates; and

4. Use uniform scales as much as possible, contain a north arrow, and use National Geodetic Vertical Datum (NGVD) as a basis for all elevations.

(g) A map or aerial photograph of the area showing land use and zoning within one mile of the phosphogypsum stack system. This map, or photograph which shall be taken within one year of the permit application, shall be of sufficient scale to show all homes, industrial buildings, wells, water courses, dry runs, rock out-croppings, roads and other significant details. All significant features shall be indicated and labeled on the map or aerial photograph.

(h) A plot plan of the phosphogypsum stack system site showing dimensions, original elevations, proposed final contours and location of soil borings. Cross sections shall be included on the plot plan or on separate sheets showing both the original and proposed elevations. The scale of the plot plan shall not be greater than 200 feet to the inch.

(i) Topographic maps at a scale of not over 200 feet to the inch with five-foot contour intervals. These maps shall show at least: the proposed phosphogypsum stack system area; access roads; grades required for proper drainage; and a typical cross section of any phosphogypsum stacks, cooling ponds, and process wastewater drainage conveyances.

(j) A hydrogeological investigation in accordance with Rule 62-701.410, F.A.C., which is incorporated by reference herein.

(k) A geotechnical investigation in accordance with Rule 62-701.420, F.A.C., which is incorporated by reference herein.

(l) Evidence of an approved laboratory to do ground water monitoring in accordance with Rule 62-160, F.A.C.

(m) A demonstration of ownership or control of the property.

(n) Financial documents assigned to the Department which ensure the financial responsibility for the closing and long-term care of the phosphogypsum stack system.

(4) Notice of application. An applicant for a permit to construct, expand, or close a phosphogypsum stack system shall publish and provide proof of publication to the Department, at its own expense, a Notice of Application in a newspaper of general circulation in accordance with Rule 62-103.150, F.A.C.

(5) Construction, operation and closure permits. After receipt of a complete application to construct, operate, expand, or close a phosphogypsum stack system, the Department shall:

(a) Issue a construction and operation permit for a new or expanded phosphogypsum stack system. After all significant initial construction has been completed and before operation, the engineer shall complete a Certificate of Construction Completion, Form 62-673.900(2), Certification of Construction Completion for a Phosphogypsum Stack System, effective 3-25-93, which is adopted and incorporated herein by reference, and contact the Department to arrange for Department representatives to inspect the facility in the company of the permittee and the engineer. This form may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400. The inspection is to ensure that the facility has been constructed in accordance with the approved permit. The facility shall not be operated or accept phosphogypsum or process wastewater except as necessary for construction and testing until the Department has found that all applicable submissions required for the permit, including financial responsibility documentation, have been received and found acceptable; or

b. Issue an operation permit for a new or expanded phosphogypsum stack system that has been satisfactorily constructed, or to an existing system which is being operated in accordance with applicable portions of this chapter at the time for renewal of their permit; or

c. Issue a closure permit for closing and long-term care of the system that has satisfied the requirements of Rules 62-673.600-.640, F.A.C. Permits shall be renewed in accordance with Rule 62-4.070, F.A.C.; or

d. Deny the issuance of a permit if reasonable assurances are not provided that the applicable requirements of Chapters 62-4 and 62-673, F.A.C., will be satisfied.

(6) The design dimensions of a phosphogypsum stack system and the dimensions of the ground water vertical and horizontal zone of discharge shall be established in the permit for any new phosphogypsum stack system or lateral expansion of an existing system. A zone of discharge for an existing installation shall be established or modified in accordance with Rule 62-522.500, F.A.C., at the time of permit renewal, or at the time of issuance of a temporary operating permit.

Specific Authority 403.704, 403.061, 403.4154, F.S.

Law Implemented 403.4154, 403.707, FS.

History -- New 3-25-93, Formerly 17-673.320, Amended 1-16-97.

62-673.340 Phosphogypsum Stack System General Criteria.

(1) Performance standards. A phosphogypsum stack system shall be designed, constructed, operated, maintained, closed, and monitored throughout its design period to control the movement of waste and waste constituents into the environment so that ground water and surface water quality standards and criteria of

Chapters 62-520 and 62-302, F.A.C., will not be violated beyond the applicable zone of discharge specified for the system.

(2) Location requirements.

(a) Set back distances shall be maintained between the phosphogypsum stack system and the property boundary of sufficient width to allow for location of ground water monitoring wells in a manner that will enable detection of ground water quality changes before contaminant transport to the boundary of the permittee's zone of discharge.

(b) No part of a phosphogypsum stack system shall be located in the 100-year flood plain where it will restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the flood plain unless compensating storage is provided, or result in a washout of any part of the system.

(c) After completion of construction, phosphogypsum stack systems shall not be located within 200 feet of any natural or artificial surface water of the state, except bodies of water contained completely within the property boundaries of the facility which do not discharge from the site to surface waters unless special design features are used to assure that construction and operation of the system will not result in a violation of applicable water quality standards.

(d) Phosphogypsum stack systems shall not be located within 500 feet of an existing or approved shallow water supply well used for drinking water unless disposal takes place in a phosphogypsum stack system for which a complete permit application was filed, or which was originally permitted, before the shallow water supply well was in existence.

(3) Operation plan. The owner or operator of a phosphogypsum stack system shall have an operation plan that provides written, detailed instructions for the daily operation of the system. The operation plan shall be kept at or near the facility and shall be accessible to operators of the system.

(4) Ground water monitoring.

(a) Monitor well location, construction, and the collection and testing of samples shall be as specified in Rule 62-522.600 and 62-4.246, F.A.C., and Chapter 62-160, F.A.C.

(b) All ground water monitoring data shall be displayed in graphic form for analyzing trends in water quality.

(c) When requested by the Department the facility operator shall inform the Department of the next sampling schedule so that a representative of the Department may be present to collect a split sample.

(5) Surface water management. Phosphogypsum stack systems shall be operated to provide for the collection, control, recycling and treatment of surface runoff from the site as necessary to meet the applicable water quality standards of Chapters 62-520 and 62-302, F.A.C.

(6) Leachate management. Any leachate emanating from a phosphogypsum stack system shall be collected and routed to a cooling pond or surge pond, contained and treated as necessary to meet the applicable water quality standards of Chapters 62-302, 62-520, and 62-660, F.A.C.
Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.340, Amended 12-10-96.

62-673.400 Phosphogypsum Stack System Construction Requirements.

(1) Minimum design standards. The requirements of this rule are the minimum standards for constructing a phosphogypsum stack system. Nothing in this rule shall be construed to prevent the Department from imposing more stringent standards if necessary to protect the environment and the public health and safety due to site specific conditions. An applicant whose system design meets the design standards of this rule will be presumed to provide reasonable assurance that the performance standards of Rule 62-673.340(1), F.A.C., will be met. This presumption may be overcome through a demonstration that site-specific or situation-specific circumstances require the imposition of stricter standards in order to provide such reasonable assurances.

(2) Liner and leachate control systems. Phosphogypsum stacks shall be constructed with composite liners and leachate control systems. Cooling ponds shall be constructed with composite liners.

(a) Liners shall be:

1. Constructed of materials that have appropriate physical, chemical, and mechanical properties to prevent failure due to physical contact with the phosphogypsum, process wastewater or leachate to which they are exposed, climatic conditions, the stress of installation, and other applied stresses and hydraulic pressures which are anticipated during the operational and closure period of the system. The supplier of materials for the liner components shall provide test information accepted by the engineer of record, that supports the capabilities of the materials to meet these needs;

2. Installed upon a base and in a geologic setting capable of providing structural support to prevent overstressing of the liner due to settlements and applied stresses;

3. Constructed so that the bottom of the liner system is not subject to fluctuations of the ground water so as to adversely impact the integrity of the liner system;

4. Designed to resist hydrostatic uplift if the liner is located below the seasonal high ground water table; and

5. Installed to cover all surrounding earth which could come into contact with the phosphogypsum, process wastewater or leachate.

(b) Liner design standards. The synthetic component of composite liners shall consist of a 60-mil or thicker geomembrane liner with a maximum water vapor transmission rate of .24 grams per square meter per day as determined by ASTM Method E96-80, procedure BW, "Test Methods for Water Vapor Transmission of Materials," Sections 04.06, 08.03, and 15.09, which document is incorporated herein by reference. The other component of the composite liner shall consist of either of the following:

1. A layer of compacted soil at least eighteen inches thick, placed below the geomembrane, with a maximum hydraulic conductivity of 1×10^{-7} centimeters per second, constructed in six-inch lifts. The geomembrane liner component shall be installed in direct and uniform contact with the compacted soil component to retard leachate migration if a leak in the flexible membrane liner should occur.

2. A layer of mechanically compacted phosphogypsum at least 24 inches thick, placed above the geomembrane, with a maximum hydraulic conductivity of 1×10^{-4} centimeters per second.

(c) Any proposed composite liner design shall be accompanied by a detailed construction quality assurance plan prepared in accordance with the requirements of Rule 62-701.400(8), F.A.C., describing in detail how the design will be properly constructed in the field. For composite liners using compacted phosphogypsum, the quality assurance plan shall place particular emphasis on protection of the geomembrane during placement and compaction of the phosphogypsum, and on prompt placement of phosphogypsum on the geomembrane.

(d) The following liner design standards are adopted by reference and incorporated herein:

1. Rule 62-701.400(3)(d), F.A.C., standards for geomembranes, except for subparagraphs 2. and 3.;

2. Rule 62-701.400(3)(e), F.A.C., specifications for geosynthetic components. In addition, the synthetic liner material shall be subjected to continuous spark testing at the production facility prior to delivery to the site for installation. If the continuous spark testing detects any defect, the tested material must be rejected and not delivered to the site;

3. Rule 62-701.400(3)(f), F.A.C., standards for soil components;

4. Rule 62-701.400(7), F.A.C., liner systems construction quality assurance; and

5. Rule 62-701.400(8), F.A.C., soil liner construction quality assurance.

(e) Leachate control system standards.

1. A perimeter underdrain system designed to stabilize the side slopes of the phosphogypsum stack shall be installed above the geomembrane liner.

2. Perimeter drainage conveyances used in the leachate control system shall either consist of covered or uncovered ditches which are lined continuously with the phosphogypsum stack liner, or of chemically compatible leachate collection pipes. Covered ditches shall have maintenance manholes installed at appropriate intervals. Piped systems shall have manholes or appropriate cleanout structures at appropriate intervals. In the event that unusual site specific hydrogeologic or structural conditions exist, the Department reserves the right to impose stricter standards consistent with obtaining appropriate reasonable assurance that ground and surface water quality standards will be met.

3. All toe drain or leachate collection systems must be constructed within the lined system.

(f) Liquid containment and conveyance systems.

1. Composite liners shall be used on all liquid containments and conveyances associated with phosphogypsum transport, cooling water, and return of process wastewater. Exceptions are pumped flow systems contained in pipes.

2. Pump and piping systems associated with the transport of phosphogypsum or process wastewater and which cross surface waters must be double contained with chemically compatible materials in a manner that assures that all materials under pumped flow are contained within a lined system in the event of a leak or piping system failure.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.400.

62-673.500 Operation Requirements.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History New 3-25-93, Formerly 17-673.5O0, Repealed 1-16-97.

62-673.600 Closure of Phosphogypsum Stacks.

(1) Applicability. Rules 62-673.600 - 17.673.650, F.A.C., are applicable to all existing phosphogypsum stack systems, active or inactive, except those closed or required to be closed under a Department permit or pursuant to a consent order in effect before March 25, 1993. These rules also apply to all construction permit applications for new phosphogypsum stack systems.

(2) By September 21, 1993, owners or operators of inactive phosphogypsum stack systems shall submit a closure permit application to the Department on Form 62-673.900(3), Application for Permit to Close a Phosphogypsum Stack System,

effective 3-25-93, which is adopted and incorporated herein by reference. This form may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400. The application shall include a closure plan as specified in Rule 62-673.610, F.A.C. The application shall include a closure plan as specified in Rule 62-673.610, F.A.C.

(3) By September 21, 1993, owners or operators of active phosphogypsum stack systems shall submit general plans and schedules for closure of the facility and shall comply with Rule 62-673.640, F.A.C.

(4) Applicants for construction permits for new phosphogypsum stack systems or lateral expansions of existing systems shall include in the application general plans and schedules for closure of the facility, and shall comply with Rule 62-673.640, F.A.C.

(5) At least 90 days before the deactivation of a phosphogypsum stack system, the owner or operator shall submit a closure permit application including a closure plan to the Department to comply with Rule 62-673.610, F.A.C. For purposes of this section, a phosphogypsum stack system is considered inactive when it is no longer receiving phosphogypsum and when the owner or operator does not intend to, and in fact does not, deposit any significant quantity of phosphogypsum there within one year.

(6) The owner or operator of a phosphogypsum stack system may request in writing a determination by the Department that the provisions of subsection (5) of this section shall not apply, and shall request approval of a temporary deactivation of the phosphogypsum stack system on a yearly basis. The Department shall authorize by order each temporary deactivation approved for an individual phosphogypsum stack system in accordance with this paragraph or shall deny by order the request for such approval. Each request shall set forth at least the following information:

(a) The specific phosphogypsum stack system or phosphogypsum stack for which approval is sought;

(b) A demonstration that current economic conditions justify a temporary deactivation of the phophosypsum stack system;

(c) An estimate of the duration of the temporary deactivation of the phosphogypsum stack system, and a demonstration that the stack system is reasonably expected to become active within this estimated time period; and

(d) A description of the measures to be taken to assure that the phosphogypsum stack system will pose no significant threat to the public health and the environment during the temporary deactivation.

Specific Authority 403.4154, 403.704, 403.061, FS.
Law Implemented 403.4154, 403.707, FS.
History -- New 3-25-93, Formerly 17-673.600, Amended 1-16-97.

62-673.610 Closure Plan Requirements.

All closure plans shall address the following requirements, or shall contain an explanation of why the requirement is not applicable. Valid information on record in an existing permit or approved groundwater monitoring plan may be used to satisfy the applicable requirements of this rule.

(1) General information report. This report shall contain:

(a) Identification of the phosphogypsum stack system;

(b) Name, address and phone number of primary contact persons;

(c) Identification of persons or consultants preparing this report;

(d) Present property owner and phosphogypsum stack system operator;

(e) Location by township, range and section, and latitude and longitude of the phosphogypsum stack system;

(f) Total acreage of the phosphogypsum stack system and total acreage of the facility property;

(g) Legal description of property on which the phosphogypsum stack system is located; and

(h) History of the phosphogypsum stack system, including construction dates and a general description of operations.

(2) Area information report. A report on the area in which the phosphogypsum stack system is located shall be included in the closure plan. The report may use verifiable information available from published documents. The term "area" means that area which may affect or be affected by the phosphogypsum stack system, and at a minimum includes the land within a one-mile radius of the phosphogypsum stack system. The report shall be supplemented by maps and cross-section drawings. The following topics shall be addressed in the report:

(a) Topography;

(b) Hydrology, including surface water drainage patterns and hydrologic features such as surface waters, springs, drainage divides and wetlands;

(c) Geology, including the nature and distribution of lithology, unconsolidated deposits, major confining units and sinkholes;

(d) Hydrogeology, including depth to groundwater table, groundwater flow directions, recharge and discharge areas used by public and private wells within one mile of the phosphogypsum stack system;

(e) Ground and surface water quality;

(f) Land use information. The report shall include a discussion and maps indicating:

1. dentification of adjacent landowners;
2. Zoning;
3. Present land uses; and
4. Roads, highways, right-of-ways, or other easements.

(3) Groundwater monitoring plan and site specific information. The closure plan shall include an approved groundwater monitoring plan containing site specific information which meets the criteria specified in Rule 62-522.600(3), F.A.C.

(4) Assessment of effectiveness of existing phosphogypsum stack system design and operation. Based on the area information report and the groundwater monitoring plan, an assessment shall be prepared which discusses the effects of the phosphogypsum stack system on adjacent ground and surface waters, and the phosphogypsum stack system area. Specific concerns to be addressed are:

(a) Effectiveness and results of the groundwater investigation; and

(b) Effects of surface water runoff, drainage patterns, and existing storm water controls;

(5) Closure plan performance standards. The closure plan and closure design plan shall be developed to meet the following performance standards.

(a) Closure plans for phosphogypsum stack systems shall be designed to:

1. Control, minimize or eliminate, to the extent necessary to protect human health and the environment, the post closure escape of phosphogypsum, process wastewater, leachate, and contaminated runoff to ground and surface waters;

2. Minimize leachate generation;

3. Detect, collect, and remove leachate and process wastewater efficiently from the phosphogypsum stack system, and promote drainage of process wastewater from the phosphogypsum stack;

4. Be compatible with any required ground water or surface water corrective action plan;

5. Minimize the need for further maintenance.

(b) Closure plans for phosphogypsum stacks shall include a final cover system designed to:

1. Promote drainage off the stack;

2. Minimize ponding;

3. Minimize erosion;

4. Minimize infiltration into the phosphogypsum stack.

5. Function with little or no maintenance.

(c) Closure plans for ponds and drainage conveyances storing process wastewater shall be designed to:

1. Treat or remove from the ponds and drainage conveyances all process wastewater as soon as practical, either through return of the process wastewater to the manufacturing process, transfer of process wastewater to another pond permitted in accordance with this rule, in-situ treatment, or by treatment and subsequent discharge of the process wastewater under an appropriate discharge permit;

2. Place any sludges removed from a pond or drainage conveyance into an active phosphogypsum stack permitted in accordance with this rule, or an inactive stack undergoing closure in accordance with this rule. The closure plan shall contain a

detailed description of procedures for removing or treating the sludges, methods for sampling and testing surrounding soils, and criteria for determining the extent of removal required to satisfy the closure performance standards.

(6) Closure design plan. A closure design plan shall be prepared to meet the closure plan performance standards and shall be based on the area information report, groundwater monitoring plan, and assessment of the effectiveness of the existing phosphogypsum stack system design and operation. The closure design plan shall consist of engineering plans and a report on closing procedures which shall apply to the closing of the phosphogypsum stack system and the monitoring and maintenance during the long-term care period. The closure design plan shall include the following information:

(a) A plan sheet showing phases of site closing.

(b) Drawings showing existing topography and proposed final elevations and grades.

(c) For phosphogypsum stacks, final cover installation plans showing the sequence of applying final cover, including thickness and type of material that will be used. All phosphogypsum stacks shall have a final cover designed to meet the performance standards. Final cover shall be placed over the entire surface of the phosphogypsum stack. The final cover shall be vegetated with drought-resistant species to control erosion, whose root systems will not penetrate any low-permeability barrier layer. Water balance calculations, based on available climatic data, shall be prepared which estimate the rates and volumes of water infiltrating the cover systems, collected by any leachate control system, and migrating out of the bottom of the stack or liner system. Final cover may consist of synthetic membranes, soils, or chemically or physically amended soils or phosphogypsum.

1. Side slopes and all other grades shall be designed to minimize erosion of the final cover material. Such designs shall consider the erosion susceptibility of the material proposed for final cover relative to historical rainfall patterns for the area, the ability to establish and maintain vegetation and special maintenance procedures proposed to insure that infiltration and erosion are minimized. If the side slopes of any stack are steeper than a two-foot horizontal run to one foot vertical rise, the closure design plan shall include a stability analysis demonstrating the longterm stability of the area.

2. Top gradients of final cover on phosphogypsum stacks shall be designed to prevent ponding or low spots and minimize erosion.

a. The final cover on the top gradient shall consist of a barrier soil layer at least 18 inches thick, emplaced in 6-inch thick lifts. A final, 18-inch thick layer of soil or amended phosphogypsum that will sustain vegetation to control erosion shall be placed on top of the barrier layer. For unlined stacks, the barrier layer shall have a maximum permeability of 1×10^{-7} cm/sec; for lined stacks, the barrier layer shall have a maximum permeability of 1×10^{-5} cm/sec. If less permeable soils are used, the

thickness of the barrier layer may be decreased to 12 inches provided that infiltration is minimized to an equivalent degree.

b. A geomembrane may be used as an alternative to the low-permeability soil barrier for a final cover, constructed to preclude rainfall infiltration into the stack. A geomembrane used in final cover shall be a semi-crystalline thermoplastic at least 40 mils thick, or a non-crystalline thermoplastic at least 30 mils thick, with a maximum water vapor transmission rate of 2.4 grams per square meter per day, have chemical and physical resistance to materials it may come in contact with, and withstand exposure to the natural environmental stresses and forces throughout the installation, seaming process, and settlement of the phosphogypsum during the closure and long-term care period. A protective soil layer at least 24 inches thick shall be put on top of the geomembrane. Material specifications, installation methods, and compaction specifications shall be adequate to protect the barrier layer from root penetration, resist erosion, and remain stable on the final design slopes. This layer shall include soils or amended phosphogypsum that will sustain vegetative growth.

3. The closure design plan shall describe provisions for cover material for long-term care erosion control, filling other depressions, maintaining berms, and general maintenance of the phosphogypsum stack, and shall specify the anticipated source and amount of material necessary for proper closure of the stack.

(d) The type of leachate control system proposed. The leachate control system shall be designed to prevent leachate from causing violations of water quality standards beyond the approved zone of discharge for the phosphogypsum stack system in accordance with Chapters 62-520 and 62-522, F.A.C.

(e) Compliance with groundwater protection requirements. The closure design plan shall show how the phosphogypsum stack system will meet the water quality standards of Chapter 62-520, F.A.C. The groundwater monitoring plan and sampling schedule may be adjusted for a phosphogypsum stack system where groundwater contamination is not evident or corrective measures have been taken to correct contamination.

(f) The proposed method of stormwater control. This shall include control of stormwater occurring on the phosphogypsum stack system. Stormwater or other surface water which mixes with leachate shall be considered to be leachate and shall be treated to meet the applicable water quality standards of Chapter 62-302, F.A.C., at the point of discharge. The stormwater control plan shall meet the requirements of Chapter 62-25, F.A.C.; however, nothing herein shall be construed to preclude application of the requirements of the appropriate water management district.

(g) The proposed method of access control. The closure design plan shall describe how access to the closed phosphogypsum stack system shall be restricted to prevent any future waste dumping or use of the phosphogypsum stack system by unauthorized persons. Restricted access shall remain in force until the

phosphogypsum stack system is stabilized and there is no evidence that the property is being used as an unauthorized dump site.

(h) A description of any proposed final use of the phosphogypsum stack system.

(i) Closure construction quality assurance plan. A detailed construction quality assurance plan shall be developed for construction activities associated with the closure of the phosphogypsum stack system, including each component of the final cover system. The plan shall specify quality assurance test procedures and sampling frequencies. Records shall be kept to document construction quality and demonstrate compliance with plans and specifications. Upon completion of closure activities a final construction quality assurance report shall be submitted to the Department, prepared by a registered professional engineer. The final report shall include at least the following information:

a. Listing of personnel involved in closure construction and quality assurance activities;

b. Scope of work;

c. Outline of construction activities;

d. Quality assurance methods and procedures;

e. Test results (destructive and non-destructive, including laboratory results); and

f. Record drawings.

(7) Closure operation plan. A closure operation plan shall be included in the closure plan, and shall:

(a) Describe the actions which will be taken to close the phosphogypsum stack system, such as placement of cover, grading, construction of berms, ditches, roads, retention-detention ponds, installation or closure of wells and boreholes, installation of fencing or seeding of vegetation, protection of on-site utilities and easements;

(b) Provide a time schedule for completion of the closing and long-term care;

(c) Contain appropriate references to the closure design plan, area information report, groundwater monitoring plan, and other supporting documents;

(d) Describe the proposed method of demonstrating financial responsibility for the long-term monitoring and maintenance; and

(e) Indicate any additional equipment and personnel needed to complete closure of the phosphogypsum stack system.

(f) Describe any proposed use of the system for water storage or water management.

(8) Certification by registered professional engineer. Information, plans, and drawings presented in support of a closure plan shall be prepared under the direction of, and certified by, a registered professional engineer authorized to practice in the State of Florida in accordance with the provisions of Chapter 471, F.S. A letter of appointment shall be submitted by the proper company official confirming that the

engineer is authorized to prepare plans and specifications. The professional engineer or another qualified engineer shall be required to make periodic inspections during the closing of the phosphogypsum stack system to insure closure is being accomplished according to the closure plan.

(9) Nothing in the section is intended to preclude the construction of a lined cooling pond on top of an inactive phosphogypsum stack, as long as the pond is constructed in accordance with the applicable provisions of this chapter, and as long as the design is included in the closure plan. Within such a cooling pond, the requirements for minimizing ponding and establishing vegetative cover are not applicable.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.610.

62-673.620 Closure Procedures.

(1) Closing inspections. The Department shall specify in the closure permit or closure plan which particular closing steps or operations must be inspected and approved by the Department before proceeding with subsequent closure actions.

(2) Final survey and record drawings. A final survey shall be performed after closure is complete by an engineer or a registered land surveyor to verify that final contours and elevations of the phosphogypsum stack system are in accordance with the plans as approved in the permit. Aerial mapping techniques which provide equivalent survey accuracy may be substituted for the survey. The survey or aerial mapping information shall be included in a report along with information reflecting the record drawings of the phosphogypsum stack system. Contours should be shown at no greater than five-foot intervals. The owner or operator shall submit this report to the Department in accordance with the closing schedule.

(3) Certification of closure construction completion. A certification of closure construction completion, signed, dated and sealed by the engineer of record, shall be provided to the Department upon completion of closure.

(4) Official date of closing. Upon receipt of the documents required in subsections (2) and (3) of this section, the Department shall, within 30 days, acknowledge by letter to the facility operator that notice of termination of operations and closing of the phosphogypsum stack system has been received. The date of this letter shall be the official date of closing for purposes of determining the long-term care period.

(5) Use of closed phosphogypsum stack systems. Closed phosphogypsum stack systems, if disturbed, are a potential hazard to public health, groundwater and the environment. The Department retains regulatory control over any activities which may affect the integrity of the environmental protection measures such as the final cover.

drainage, liners, monitoring system, or leachate and stormwater controls. Consultation with the Department is required before conducting activities at the closed phosphogypsum stack systems.
Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.620.

62-673.630 Long-Term Care.

(1) Long-term care period. The owner or operator of any phosphogypsum stack system subject to the requirements of Rules 62-673.600 -.620, F.A.C., shall be responsible for monitoring and maintenance of the facility in accordance with an approved closure plan for 50 years from the date of closing. Before the expiration of the long-term care monitoring and maintenance period the Department may extend the time period if the closure design or closure operation plan is found to be ineffective.

(2) Reduced long-term care period. The owner or operator of a phosphogypsum stack system may apply to the Department for a reduced long-term care schedule if reasonable assurance is provided to the Department that there is no significant threat to human health or the environment and if the phosphogypsum stack system:

(a) Has been constructed and operated in accordance with approved standards, has a leachate control system and a liner;

(b) Was closed with appropriate final cover, vegetative cover has been established, and a monitoring system has been installed;

(c) Has a 20-year history after closure of no violations of water quality standards or criteria detected in the monitoring system, and no increases over background water or any monitoring parameters which may be expected to result in violations of water quality standards or criteria; and

(d) Has had no detrimental erosion of cover.

(3) Right of access. The owner or operator of the phosphogypsum stack system shall possess or acquire a sufficient interest in, or a right to use, the property for which a permit is issued, including the access route onto the property to carry out the requirements of this rule. The permittee shall retain the right of entry to the phosphogypsum stack system for the long-term care period, after termination of disposal operations, for inspection, monitoring and maintenance of the site.

(4) Successors in interest. Any person acquiring rights or ownership, possession or operation of a permitted phosphogypsum stack system through lease or transfer of property shall be subject to all requirements of the permit for the facility and shall provide any required proof of financial responsibility to the Department in accordance with this rule. Any lease or transfer of property shall include specific conditions to delineate:

(a) The previous owner or operator is responsible for closure and shall maintain any required proof of financial responsibility until the person acquiring ownership, possession or operation of the phosphogypsum stack system establishes the required proof of financial responsibility with the Department;

(b) Responsibility for the continuance of monitoring, maintenance, and correction of deficiencies or problems; and

(c) Mineral rights attached to the property and the rights to any recoverable materials that may be buried on the property. A Department permit shall be required if any on-site operations subsequent to closure involve disturbing the phosphogypsum stack system.

(5) *Transfer of permit.* Transfer of the phosphogypsum stack system permit shall be in accordance with the provisions of Rule 62-4.120, F.A.C., and this rule.

(6) Replacement of monitoring devices. If a monitoring well or other device required by the monitoring plan is destroyed or fails to operate for any reason, the phosphogypsum stack system owner or operator shall, immediately upon discovery, notify the Department in writing. All inoperative monitoring devices shall be replaced with functioning devices within 60 days of the discovery of the malfunctioning unit unless the owner or operator is notified otherwise in writing by the Department.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 3-25-93, Formerly 17-673.630.

62-673.640 Financial Responsibility.

(1) As a condition for the issuance of a construction permit for a phosphogypsum stack system, or for approval of a closure permit or closure plan, the owner or operator shall post a bond with the Department equal to the estimated costs of closing and long-term care of the phosphogypsum stack system. The bond shall comply with the requirements of 40 CFR Part 264, Subpart H, as adopted by reference in subsection (4) of this section.

(2) Cost estimates.

(a) The owner or operator shall estimate the total cost of closure for the phosphogypsum stack system for the time period in the operation when the extent and manner of its operation make closing most expensive. The annual cost of long-term care shall be estimated and listed separately, and multiplied by 50 years. The owner or operator shall submit the estimates, together with all necessary justification, to the Department for approval along with the proof of financial responsibility. The costs shall be estimated by a professional engineer registered in the State of Florida in accordance with provisions of Chapter 471, F.S., for a third party performing the work, on a per unit basis, with the source of estimates indicated.

(b) Closing costs shall include estimated costs of cover material, topsoil, seeding, fertilizing, mulching, labor, and any other costs of compliance with Rules 62-673.610 and 62-673.620, F.A.C.

(c) Long-term care costs shall include land surface care, leachate pumping, transportation, monitoring and treatment, groundwater monitoring, collection and analysis, and any other costs of compliance with Rule 62-673.630, F.A.C.

(3) Cost adjustments.

(a) During the life of the phosphogypsum stack system, the owner or operator shall revise the closure cost estimate for inflation and changes in the closure and long-term care plan. Such revisions shall be made at the time of permit renewal and used as the basis for comparison against the amount of the bond or the value of an alternative funding mechanism.

(b) If the value of the bond or alternate funding mechanism is less than the total amount of the current closure cost estimate, the owner or operator shall revise the funding mechanisms to reflect the new estimate within the time frames outlined in 40 CFR Part 264, Subpart H.

(c) If the value of the bond or alternate funding mechanism is greater than the total amount of the current closure cost estimate, the owner or operator may reduce the value of the bond or funding mechanism to reflect the new estimate.

(4) Alternate proof of financial responsibility.

(a) An owner or operator may request an alternate proof of financial responsibility in lieu of, or in combination with, the requirements of subsection (1) of this section. Such alternate proof may include letters of credit, trust fund agreements, closure insurance or financial tests and corporate guarantees showing that the owner or operator has sufficient financial resources to cover, at a minimum, the costs of complying with all closure and long-term care requirements.

These shall be submitted on forms provided by the Department in accordance with the requirements of paragraphs (b) and (c) of this subsection. The owner or operator shall estimate such costs pursuant to subsection (2) of this section.

(b) 40 CFR Part 264 Subpart H which contains EPA's rules on financial requirements for owners and operators of hazardous waste facilities are hereby adopted and incorporated by reference as those rules appear in 40 CFR 264, revised as of July 1, 1988, except:

1. The following sections of 40 CFR Part 264 Subpart H are specifically not adopted as part of this rule:

a. 264.140(a); 264.140(b); 264.141(a); 264.141(e); 264.147; 264.149; 264.150; and 264.151.

b. All references to 40 CFR Part 265.

c. All references to sections or subparts of 40 CFR 264 not contained in Subpart H.

d. All references to EPA Regions.

e. All references to RCRA or Section 3008 of RCRA.

2. References in 40 CFR 264 Subpart H to the United States Environmental Protection Agency (EPA) shall mean the State of Florida Department of Environmental Protection; to Regional Administrator shall mean the Secretary of the Department; to RCRA permits shall mean phosphogypsum stack systems permits; to post-closure care/post-closure cost estimate shall mean long-term care/long-term cost estimate; to EPA identification number shall mean the Department identification number; to hazardous waste shall mean phosphogypsum; and to hazardous waste treatment, storage or disposal facilities shall mean phosphogypsum stack systems.

(c) The series of financial responsibility forms, form 62-673.900(4)(a) - (h), which are adopted and incorporated herein by reference, shall be used when submitting proof of financial responsibility under this rule. This form and its parts may be obtained by contacting the appropriate district office or by writing the Department of Environmental Protection, Bureau of Water Facilities Planning and Regulation, 2600 Blair Stone Road, MS3535, Tallahassee, Florida 32399-2400.

1. Form 62-673.900(4)(a), Trust Fund Agreement to Demonstrate Closure and/or Post-Closure Financial Assurance, effective 1-16-97.

2. Form 62-673.900(4)(b), Standby Trust Fund Agreement, effective 1-16-97.

3. Form 62-673.900(4)(c), Irrevocable Letter of Credit, effective 3-25-93.

4. Form 62-673.900(4)(d), Closure/Post-Closure Insurance Certificate, effective 3-25-93.

5. Form 62-673.900(4)(e), Financial Guarantee Bond, effective 3-25-93.

6. Form 62-673.900(4)(f), Performance Bond, effective 3-25-93.

7. Form 62-673.900(4)(g), Letter from Chief Financial Officer, effective 3-25-93.

8. Form 62-673.900(4)(h), Corporate Guarantee, effective 3-25-93.

Specific Authority 403.4154, 403.704, 403.061, FS.
Law Implemented 403.4154. 403.707, FS.
History -- New 3-25-93, Formerly 17-673.640, Amended 1-16-97.

62-673.650 Closure of Unlined Systems.

(1) Closure of existing systems. No phosphogypsum or process wastewater shall be placed in an unlined phosphogypsum stack system after March 25, 2001; however, such systems may be used for water storage and water management purposes to facilitate closure. Final closure of each unlined system shall be completed as expeditiously as practicable and no later than five years after it ceases accepting phosphogypsum. For purposes of this subsection, "unlined" means that the phosphogypsum stack or cooling pond was constructed without an installed liner made of synthetic materials, soils, or a combination of these and approved by the Department at the time of construction.

(2) The provisions of subsection (1) of this section shall not apply to a phosphogypsum stack system, or any portion of that system, if the owner or operator of that system demonstrates to the Department that:

(a) Such system was not causing any violation of a Department water quality standard or criterion on March 25, 1993, and is not reasonably expected to cause any such violation after March 25, 1993; or

(b) The owner or operator will implement corrective measures which will contain seepage from the stack system at or within the permitted zone of discharge and, through further corrective measures or as a result of natural processes, groundwater quality at the edge of the permitted zone of discharge will be in compliance with all applicable Department standards and criteria by March 25, 2001.

(3) The demonstrations authorized by subsection (2) of this section may be made through a permit application or through submittals required by a consent order or an amendment to an existing consent order issued by the Department.

(4) Nothing in this section shall be construed to limit the Department's authority to require closure of any phosphogypsum stack system as part of an enforcement action as necessary to protect the public health or the environment.

Specific Authority 403.704, 403.061, FS.
Law Implemented 403.707, FS.
History -- New 8-1-93, Formerly 17-673.650.

62-673.900 Forms.

Specific Authority 120.53(1), 403.061, 403.704, FS.
Law Implemented 120.53(1), 403.707, FS.
History -- New 3-25-93, Formerly 17-673.900, Repealed 1-16-97.

CHAPTER 62-671
PHOSPHATE MINING WASTE TREATMENT REQUIREMENTS

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62-671.100 Scope/Intent/Purpose. (Repealed)

Specific Authority 403.061, FS.
Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.
History -- New 11-27-89, Formerly 17-671.100, Repealed 12-24-96.

62-671.200 Definitions.

The definitions set forth in Title 40, United States Code of Federal Regulations, Part 401 and Section 436.181, are adopted by reference, except where in conflict with the definitions in this rule. In addition, the definitions in Section 403.031, Florida Statutes, and the following definitions shall apply to this rule:

(1) "Mine" is any area of land, surface or underground, used for or resulting from the extraction of phosphate content from phosphate bearing materials.

(2) A "New Pollution Source" means any mine and beneficiation process for which the construction or operation of the industrial wastewater treatment facilities was not permitted before July 20, 1981. Any mine or beneficiation process for which a complete application to construct the industrial waste treatment facilities was filed with the Department on or before December 31, 1981, shall be deemed as existing. New pollution sources do not include expansions or modifications of existing sources.

(3) "Non-filterable, Non-volatile Residue (Fixed Solids)" means those solids which represent the difference between the total non-filterable residue and the total volatile residue determined in accordance with the test methods specified at page 95 of the 14th edition of Standard Methods for the Examination of Water and Wastewater.

(4) "Normal Working Level" of an impoundment means that level resulting from the normal height or number of damming boards maintained at the outfall(s) under normal operating conditions.

(5) "Points of Discharge" mean any outfall structure or location where the effluent from the mining or beneficiation process leaves the treatment system and enters waters of the State. The point of discharge shall be specified in Department permits for all discharges from a mining or benefication process.

(6) "Sample" means a representative sample of the discharge.

(7) "Total Non-filterable Residue (Total Suspended Solids)" means those solids which are retained by an approved filter and dried to a constant weight at 103° to 105° C as described at page 94 of the 14th edition of Standard Methods for the Examination of Water and Wastewater.

(8) "Total Phosphorus" means the total phosphorus in an unfiltered sample measured in milligrams per liter using the manual or automated ascorbic acid method following persulfate digestion as referenced at pages 476, 481, and 624 of the 14th

edition of Standard Methods for the Examination of Water and Wastewater or measured in accordance with a comparable analytical method approved by the United States EPA or the Department.

(9) The "1-Day Maximum" means the highest values obtained by the methods specified in this rule of total non-volatile, non-filterable residue (fixed solids) and total non-filterable residue (suspended solids) or total phosphorus (P) of any sample collected as defined in (6) during a 24-hour period.

(10) The "30-Day Average" means the flow-weighted arithmetic mean of all the measured pollutant values obtained during any calendar month and analyzed in accordance with this rule. However, if during any calendar month there are three or less measured pollutant values, then the average shall be computed using the most recent four values.

Specific Authority 403.061, FS.
Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.
History -- New 11-27-89, Formerly 17-671.200.

62-671.300 Effluent Limitations.

he effluent guidelines and standards for mineral mining and processing in Rule 62-660.400(1)(e)31., F.A.C., apply herein, except where the provisions of this rule are more specific.

(1) The following effluent limitations apply to effluent discharges by a pollution source after application of the best practicable control technology currently available (BPT) and the best available technology economically achievable (BAT) or which may be discharged by a new pollution source, unless a more stringent standard is specified in accordance with Rule 62-671.310, F.A.C., measured at the point(s) of discharge as specified in a Department permit:

	1 Day Max.	30 Day Avg.
Total non-volatile, non-filterable residue (mg/1)	25	12
Total non-filterable residue (mg/1)	60	30
Total P* mg/1	5	3
pH	6.0 - 9.0	6.0 - 9.0

*Total Phosphorus shall be for monitoring and reporting only, except: if monitoring data shows total phosphorus levels exceed 3 mg/1 monthly average for more than one 30-day period per calendar year, the discharges, upon written notification by the Department, shall prepare and file within 120 days (unless the time is extended by the Department) a study consisting of the following: (a) a chronology of at least one year's

discharge data; (b) an assessment of the cause and origin of the phosphorus constituent of the discharge, (c) description of the discharger's current maintenance, operation and management practices directly related to the control of phosphorus, (d) an evaluation of the environmental significance of the phosphorus levels; and (e) an identity of reasonable methods to abate, to the extent practicable, the influx of phosphorus into the discharge. Upon receipt of the report the Department shall require the applicant to publish a public notice in a newpaper of general circulation in the affected area which states that the report was received and where it is available for public inspection. The Department shall evaluate the report and may amend the discharger's permit to reflect additional requirements (subject to administrative and judicial review), including the implementation of cost-effective management practices or technological advances which reduce or eliminate the phosphorus in the discharge to the maximum extent practicable.

(2) To correct for losses during the testing and analysis, the analytic results from the above specified tests for non-filterable, non-volatile residue (fixed solids) shall be multiplied by a factor of 1.1 to be reported as total non-volatile, non-filterable residue.

(3) Monitoring requirements for effluent limitations shall be, as a minimum, the collection and analysis of one sample per week for each point of discharge when there is a discharge. When there is no discharge, the sample shall be taken the day of the next discharge.

(4) Any overflow caused by precipitation exceeding a 10-year 24-hour precipitation event from facilities designed, constructed, and operated to contain or treat to the applicable limitations the precipitation and runoff resulting from a 10-year 24-hour precipitation event shall not be subject to the effluent limitations of this section. No such overflow shall lower the level of any impoundment below the normal working level of that impoundment or any other impoundment, or below those levels that existed immediately prior to the 10-year 24-hour precipitation event. Provided, however, no source shall be relieved from compliance with Chapter 62-9, F.A.C.

Specific Authority 403.061, FS.

Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.

History -- New 11-27-89, Formerly 17-671.300, Amended 12-24-96.

62-671.310 New Source Requirements.

New pollution sources shall comply with the effluent limitations determined by the Department in accordance with this Rule.

(1) The applicant shall provide the Department with the following information in addition to the information required by Rules 17-3, 62-4, 62-660 and 62-671, F.A.C.:

(a) A review of the treatment technologies being applied by similar domestic mining industries, listing the effluent concentration of pollutants, as well as a review of current literature relating to the subject of treating wastes from similar domestic mining industries.

(b) A determination of the lowest effluent limitations achievable for the facility by the application of the latest economically feasible technology.

(c) The basis for determining the effluent limitations specified in (b) above, and the basis for the determination of the economic feasibility of the technology.

(2) The Department shall make the determination of the lowest effluent limitation levels achievable for the facility by the application of the latest economically feasible technology. The limitations determined by the Department shall be for the parameters listed in Rule 62-671.300, F.A.C. and any other pollutant reasonably expected to be in the discharge and shall not be less stringent than the concentrations contained in Rule 62-671.300, F.A.C., except as provided in Rule 62-671.310(4), F.A.C. In making the determination, the Department shall give consideration to:

(a) All material submitted by the applicant.

(b) All scientific, engineering, and technical material, and other material available to the Department, including the effluent pollutant levels achieved by similar domestic mining industry or analogous treatment technologies.

(c) The social, environmental, and economic impact of the application and implementation of the achievement of the concentrations and discharge levels specified. The consequences of water conservation practices shall be considered.

(3) The effluent limitations determined in accordance with this paragraph shall be specifed in terms of 1-day maximum and 30-day average in the Department permit for the facility and shall be the effluent standards for the facility except as provided in Rule 62-671.310(4), F.A.C.

(4) If, pursuant to this Rule, the Department imposes more stringent effluent limitations than those in Rule 62-671.300, F.A.C after determining that such more stringent effluent limitations can be attained by the application of innovative technology that has not been demonstrated on an operational plant-scale basis at a phosphate mine, the actual measured concentration of pollutant levels in discharged waste waters shall constitute compliance with the provisions of this chapter and with the effluent limitations contained in the Department permit for the source; provided that the permittee installs, operates, and maintains the required innovative technology in accordance with good engineering practices, public health and safety are not jeopardized, and the beneficial uses of the receiving waters are not substantially impaired.

(5) Within 15 days after receipt of the application for a construction permit for a facility which requires a determination in accordance with this paragraph, the Department, at the expense of the applicant, shall give notice of the application in the Florida Administrative Weekly and in a newspaper of general circulation in the affected

area concerning the determination required by this paragraph. The notice shall contain, as a minimum, the following information: the name of the applicant, the location of the proposed facility, the proposed receiving water, that an application has been received, the date received, the place where the application can be reviewed, and of the determination required by this paragraph.
Specific Authority 403.061, FS.
Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.
History -- New 11-27-89, Formerly 17-671.310.

CHAPTER 62C-38
FULLER'S EARTH RECLAMATION REQUIREMENTS

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CHAPTER 62C-38
FULLER'S EARTH RECLAMATION REQUIREMENTS

62C-38.001 Intent and Applicability. (REPEALED)
Specific Authority 370.021, 378.404 FS. Law Implemented 378.404, 378.412 FS. History--New 3-19-87, Repromulgated 11-29-90, Formerly 16C-38.001, Repealed 10-20-96.

62C-38.002 Definitions.

For the purpose of this chapter, the following words and terms shall have the definitions and meanings ascribed to them in this section:

(1) "Agency" means an official, committee, department, commission, officer, division, authority, bureau, council, board, section, or unit of government within the state, including a county, municipality, or other local or regional entity or special district.

(2) "Authorized agent" means the person that acts on behalf of the operator for the purpose of reviewing and signing documents required by the department and is the primary contact for the operator for all matters related to reclamation.

(3) "Department" means the Department of Environmental Protection.

(4) "Extraction" means the removal of fuller's earth from its location, so as to make it suitable for commercial, industrial, or construction use; but does not include excavation solely in aid of on-site farming or on-site construction, nor the process of searching, prospecting, exploring, or investigating for fuller's earth.

(5) "Final highwall" means the last face of overburden or fuller's earth exposed by excavating.

(6) "Fuller's earth" means clay possessing a high absorptive capacity and consisting largely of montmorillonite or palygorskite, also known as attapulgite.

(7) "Local government" means any county or municipality.

(8) "Mine" means an area of land upon which mining operations have been conducted, are being conducted, or are planned to be conducted, as the term is commonly used in the trade.

(9) "On-site" means within the contiguous limits of an area of land under one ownership or control and upon which farming or construction activities are taking place. Areas of land that are divided by public or private roads are considered contiguous if such areas are under one ownership or control.

(10) "Operation" means any activity, other than prospecting, necessary for site preparation, extraction, waste disposal, storage, or reclamation.

(11) "Operator" means any person engaged in an operation.

(12) "Overburden" means soil and rock removed to gain access to the fuller's earth in the process of extraction and means such soil or rock before or after its removal. Overburden includes all such soil and rock that must be removed, whether it

occurs above a single stratum of extractable fuller's earth or between two or more strata of extractable fuller's earth.

(13) "Reclamation" means the reasonable rehabilitation of land where fuller's earth extraction has occurred.

(14) "Temporary land use" means any use of lands under reclamation or restoration after contouring is complete, but before release, that is necessary for the mining operation or other reclamation or restoration activities within the mine.

(15) "Wetland" means any area having dominant vegetation as defined and listed in Department of Environmental Protection Rule 62-301.400, Florida Administrative Code, regardless of whether the area is within the Department of Environmental Protection's jurisdiction or whether the water bodies are connected. Specific Authority 370.021, 378.404 FS. Law Implemented 378.403, 378.404 FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.002.

62C-38.003 Notice of Intent to Mine Required.

(1) No operator may begin the process of resource extraction at a mine without notifying the department of the intention to mine, if the mine had not been in operation on or before January 1, 1987. Notices shall be provided at least six months prior to beginning mining operations and shall be submitted by executing Form 1, as identified in section 62C-38.014. Notices shall include the following information to allow documentation, review, and evaluation of reclamation plans and to allow determination of compliance with approved plans and cross sections:

(a) General information. The following general information shall be provided so that the department may contact the appropriate affected parties, as needed, and determine if a notice is required:

1. Operator's name, mailing address, business location address, and phone number.

2. Name of parent company, corporation, etc., mailing address, business location address, and phone number.

3. Mine name, mailing address, business location address, and phone number.

4. Authorized agent's name, mailing address, business location address, and phone number.

5. The names and addresses of landowners other than the operator within the mine.

6. Date mining operations began or are to begin at this mine.

7. County or counties in which mine is located.

(b) Conceptual reclamation plan. The following information shall be provided to allow the department to evaluate the operator's recognition of, general understanding of, and ability to comply with the reclamation performance standards in section 62C-38.008. A conceptual reclamation plan shall include:

1. A separate map for each of the seven listed items that shall show the:

a. Site plan, acreage, and location by county, township, range, and sections.

b. Premining topography and drainage. U.S. Geological Survey topographic data shall be acceptable for this requirement.

c. Premining vegetation, including the acreage for each category. At a minimum, the following categories shall be shown: forested uplands, nonforested uplands, roads, lakes, streams, forested wetlands, and nonforested wetlands.

d. Total area to be mined and disturbed. Disturbed but not mined areas shall be identified separately. This map shall also show the areas projected to be mined or disturbed through the end of the first calendar year in which the mine begins operating.

e. Overburden thickness and depths to which mining will occur.

f. Postreclamation topography, drainage, and structures.

g. Postreclamation vegetation, including the acreage for each category. At a minimum, the following categories shall be shown: mixed-forest uplands, other forested uplands, nonforested uplands, roads, lakes, streams, forested wetlands, and nonforested wetlands.

2. Cross sections that show:

a. The premining stratigraphy.

b. The design of reclaimed highwalls, wetlands, and water bodies.

3. A general discussion of the mining operations and reclamation activities, including how each of the performance standards in section 62C-38.008 will be met.

4. An estimated time schedule for reclamation.

5. The estimated life of the mine.

6. A list of approved permits. This shall include copies of any dredge and fill permits approved by the U. S. Army Corps of Engineers or the Florida Department of Environmental Protection.

7. A list of pending permit applications which are related to reclamation.

8. A list of other permits which are related to reclamation and are known to be required.

9. A copy of the Application for Development Approval and the Development Order, if applicable.

(2) Prior to submitting any information required by subsection (3) below, all operators of mines that were operating on or before January 1, 1987, shall provide the department with a map of each mine that:

(a) Shows the boundary of each mine and the limits of mining within it as of October 1, 1986.

(b) Identifies all mined and disturbed areas as:

1. Mined or disturbed prior to July 1, 1975.

2. Mined or disturbed from July 1, 1975 to October 1, 1986.

3. Mined or disturbed from October 2, 1986 through January 1, 1987.

4. Mined or disturbed after January 1, 1987.

(c) Meets the map standards in section 62C-38.004.

(3) Within 30 days of the effective date of this chapter, all operators of mines that continued or began operations after October 1, 1986, who do not have conceptual plans for reclamation on file with the department shall provide the information required in paragraph (1)(a) above and a conceptual reclamation plan as specified in paragraph (1)(b) above. This information shall be provided by executing part II of Form 1, identified in section 62C-38.014.

(4) An operator shall submit requests for modifications, as needed, for all significant changes to approved conceptual plans by executing Form 2, identified in section 62C-38.014.

(a) Requests shall include the following information, at a minimum:

1. Name of mine.

2. Name of operator.

3. What modification is requested, including what specific changes must be made in the approved conceptual plan text and drawings.

4. What alternatives were considered, if any.

(b) Significant changes to approved conceptual plans are changes that affect or result in a cumulative change of more than 100 acres or more than 20 percent, whichever is smaller, of the area covered by the conceptual plan, as originally approved or most recently modified by the department.

(c) Changes required by permit conditions or requirements imposed by other agencies, including federal agencies, shall not be considered significant when such changes are consistent with the reclamation standards in section 62C-38.008.

(5) An operator may request a temporary land use as part of the original conceptual plan or any subsequent modifications or as a separate request. The request shall provide a description of the temporary land use, including the estimated dates the temporary land use will be in effect, what reclamation activities will be needed when the temporary land use ceases, and a time schedule for the reclamation activities.

(6) An operator shall notify the department no later than six months after the temporary cessation and 30 days after the permanent cessation of mining at a mine. The reason for a temporary cessation shall be given. This notice shall be provided by executing Form 4, identified in section 62C-38.014.

Specific Authority 211.32, 370.021, 378.404 FS. Law Implemented 211.32, 378.701, 378.702 FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.003.

62C-38.004 Document Format and Standards.

(1) All notices of intent to mine, conceptual reclamation plans, requests for modifications, annual reports, and other documents which may be required shall be submitted in accordance with the document format and standards in this section. The standardized forms contained in section 62C-38.014 shall be used by operators to assure that all requests that require agency action are handled in an efficient and expeditious manner.

(2) All copies of documents shall be of good quality and clearly legible.

(3) At least one copy of all documents that are to be signed shall bear an original signature.

(4) All text documents shall be submitted in an 8 1/2-inch-by-11-inch format.

(5) All pages of text, maps, drawings, cross sections, and other documents shall have a minimum margin of one-half inch on all sides.

(6) Original maps, drawings, and cross sections may be larger than 8 1/2 inches by 11 inches, but no larger than 30 inches by 40 inches.

(7) All maps, drawings, and cross sections shall be of a scale suitable to show and evaluate the required information. The original map scale for conceptual plans and modifications shall be no smaller than one inch equals 1000 feet, unless the mine or document area will not fit within the format requirements of subsections (5) and (6) above. When a scale of one inch equals 1000 feet cannot be accommodated, the scale selected shall be the largest standard scale that will show the entire mine or document area and comply with subsections (5) and (6) above. The department shall grant exceptions to the requirement that the entire mine be on a single map, if it agrees that the layout of the mine is such that more than one map would be better for showing and evaluating the required information. If an exception is granted, each map shall include an inset map of the entire mine that shows the portion of the mine represented by the larger-scale map.

(8) All maps, drawings, and cross sections shall include at least the following information:

(a) Titles that explain their purpose, including the operator's name and mine name.

(b) Legends that explain all symbols and patterns used.

(c) Scales, where appropriate. Scale bars shall be provided at a minimum.

(d) Location, where appropriate, including sections, townships, ranges, and counties. Maps or plan views shall include at least three fixed points referenced to section corners. When possible these points shall be section corners, but they should not be in a straight line. Cross sections shall have clearly defined end points that shall be located accurately on an inset or other map.

(e) North arrow, on all maps.

(f) Acreages may be rounded to the nearest acre.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1), (2) FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.004.

62C-38.005 Notification Procedures.

(1) In order to reduce the time required for processing notices of intent to mine or conceptual plans, meetings are encouraged and should be arranged with the department prior to doing substantial work on such notices and plans. If a meeting is requested by an operator, the department shall meet with the operator at the earliest

practical time or as otherwise agreed to by both parties. These meetings are for the purpose of exchanging ideas and information and shall be nonbinding on either party.

(2) The procedure in subsection (1) above should also be followed for conceptual plan modifications.

(3) Notices of intent to mine shall be submitted in accordance with the deadlines established in section 62C-38.003; however, if an operator is required to prepare an Application for Development Approval (ADA) under chapter 380, F. S., the operator shall file the notice of intent to mine within 30 days of the submittal of the ADA.

(4) Conceptual plan modification requests shall be submitted at least 90 days prior to beginning activities that require a modification to an approved conceptual plan. Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1) FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.005.

62C-38.006 Department Review Procedures.

Department reviews shall be conducted as follows:

(1) Within 30 days after receipt of an operator's notice of intent to mine, separately submitted conceptual reclamation plan, conceptual reclamation plan modification, or request for other approval, the department shall review the document and shall request the submittal of all additional information the department is permitted by law to require.

(2) The operator shall provide the requested additional information within 45 days of receipt of the request or request an extension to the 45-day period. The extension request shall include the date by which the additional information can be provided and the reason for the extension. The department shall approve reasonable requests that are based on a need to complete data collection. If the operator does not provide the requested information within the 45-day period or request an extension, the department shall proceed to final action.

(3) If the operator believes any department request for additional information is not authorized by law or agency rule, the operator may request a hearing, pursuant to section 120.57, F. S.

(4) Within 30 days after receipt of the requested additional information, the department shall review it and may request only such information needed to clarify the received additional information.

(5) If the operator believes the request of the department for such additional information, requested pursuant to subsection (4) above, is not authorized by law or department rule, the department, at the operator's request, shall proceed to process the notice of intent to mine, conceptual reclamation plan, conceptual reclamation plan modification, or other request.

(6) The department shall notify the operator as to the sufficiency of the notice of intent to mine within 90 days after receipt of the original notice of intent to mine, the last item of timely requested additional information, or the operator's written request to

begin processing the notice of intent to mine. If the department notifies the operator that the notice of intent to mine is insufficient, the notification of insufficiency shall clearly state why the notice of intent to mine is insufficient.

(7) Conceptual reclamation plans and their modifications shall be approved, modified, or denied by the department within 90 days after receipt of the original plan or plan modification, the last item of timely requested additional information, or the operator's written request to begin processing the plan or plan modification. No plan may be approved without a sufficient notice of intent to mine, if such notice is required.
Specific Authority 378.404, 378.405 FS. Law Implemented 378.404(3), 378.405 FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.006.

62C-38.007 Confidentiality and Availability of Records.

(1) All information received by the agency shall be handled, with respect to confidentiality, pursuant to section 378.406, F. S.

(2) Each original page of all confidential documents shall be stamped by the operator with the word CONFIDENTIAL in bold red letters. All confidential information, whether text or drawings, shall be kept together as a separate part of any submitted information or document. When forms are required to be used, an operator shall substitute the word "confidential" for the appropriate response and provide the information with all other confidential responses. Each confidential response shall be referenced to the appropriate item of information or requirement of the department. Any information that is not handled in this manner may be considered not to be confidential by the department.

(3) The legal basis for the confidentiality of any information shall be provided as a cover statement for all documents containing confidential information.

(4) All information received from the operator, except as provided in subsection 378.406(1), F. S., shall be available for public inspection and duplication, pursuant to subsection 378.406(2), F. S.
Specific Authority 370.021, 378.404 FS. Law Implemented 378.406 FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.007.

62C-38.008 Reclamation Standards.

The following standards shall apply to any original surface area that is initially disturbed by mining operations on or after October 1, 1986, and is not covered by an approved conceptual reclamation plan. The standards in section 62C-16.0051, as existing on September 30, 1986, shall apply to any area mined or disturbed from July 1, 1975, to October 1, 1986, except where any standard in section 62C-38.008 is less strict, then the standard in 62C-38.008 shall apply.

(1) Time Schedules.

(a) All reclamation activities shall, to the extent feasible, be coordinated with fuller's earth extraction and in any event shall be initiated at the earliest practicable

time.

1. Contouring shall be initiated and completed on an acreage equivalent to the acreage extracted in the previous calendar year no later than one year after such previous calendar year.

2. The operator may postpone contouring on acres needed for mining operations, upon a demonstration of such need. Contouring shall be completed within one year after mining operations cease in such areas.

3. Revegetation activities shall be initiated as soon as practical and completed no later than one year after the calendar year in which any area became available for revegetation.

4. If mining operations temporarily cease at a mine for more than 24 months, the operator shall:

a. Begin contouring all unreclaimed acres immediately, complete contouring at a rate equal to one-twelfth of the average annual mining rate, and complete revegetation no later than three months after contouring is completed in a given area; or

b. The operator shall post a bond or other surety in an amount and for a time acceptable to the department; or

c. The operator shall begin reclaiming an equivalent amount of nonmandatory land at the rate specified in sub-subparagraph a. above.

5. If mining operations cease for more than three years at a mine, then all of the requirements of this section shall be met.

6. The requirements of subparagraphs 4. and 5. above, whichever is appropriate, shall be suspended upon the resumption of mining.

7. The initiation and completion dates shall be determined based on information provided in the annual reports and verified by the department.

(b) Reclamation of the land, including a one-year period of establishment for vegetation after planting, shall be completed within three years of the completion of the mining operations associated with the fuller's earth extraction.

(2) Consistency with Local Governments. Reclamation activities shall be consistent with all applicable local government ordinances at least as stringent as the criteria and standards contained in this section.

(3) Adverse Impact. Reclamation activities shall be conducted in a manner which has no long-term adverse impact on surface and groundwater resources, wildlife, and adjacent lands.

(a) Site cleanup. All lands shall be reclaimed to a neat, clean condition by removing or adequately burying all visible debris, litter, junk, worn-out or unusable equipment or materials, as well as all footings, poles, pilings, and cables. Large rocks and boulders shall be placed at the base of pit walls to the extent practical to provide fill for establishing acceptable slopes; otherwise, they shall be placed in common locations at the surface or buried to a minimum depth of four feet.

(b) Structures. All temporary buildings, pipelines, and other man-made structures

shall be removed with the exception of those that are of sound construction with potential uses that are compatible with the reclamation goals.

(c) Remaining Natural Resources. The operator shall take care to protect the natural resources within the mine which are not affected by mining of the fuller's earth. Highest priority shall be given to the following concerns:

1. Protection of endangered and threatened species and their habitat.

2. Protection of surface drainage patterns and water quality, including the natural resources and integrity of natural streams and their flood plains.

3. Protection of uplands from erosion, loss of topsoil, and vegetation loss.

(4) Wetlands, Water Bodies, and Drainage.

(a) Drainage systems, wetlands, and other surface waters shall function in manners which are not significantly different from those which existed prior to fuller's earth extraction.

1. Wetlands that are within the conceptual plan area and are affected by mining operations shall be restored at least acre-for-acre and type-for-type.

2. The design of artificially created wetlands and water bodies shall be consistent with good health and safety practices, maximize beneficial contributions within local drainage patterns, provide aquatic and wetland wildlife values, and maintain downstream water quality by preventing erosion and providing nutrient uptake.

3. Water bodies should include a variety of emergent habitats and should not be designed to prevent fluctuating water levels.

4. At least 25 percent of the highwater surface area of each water body shall consist of a zone of fluctuation. In the event the water body cannot be designed to accommodate the required zone of fluctuation, this requirement shall be met by constructing additional wetlands adjacent to and hydrologically connected with the water body.

5. Each water body shall have a shallow water zone inside and adjacent to the zone of fluctuation. Subaqueous slopes in the shallow water zone shall not be steeper than four horizontal feet for each vertical foot from the inner perimeter of the zone of fluctuation to the first occurrence of a depth of six feet below the designed low water line; however, subaqueous slopes may be as steep as three horizontal feet for each vertical foot at the base of reclaimed highwalls. Subaqueous slopes from the inner perimeter of the shallow water zone to the pit bottom shall not be steeper than one horizontal foot for each vertical foot.

6. Slope requirements of the U. S. Army Corps of Engineers or the Department of Environmental Protection under the Warren S. Henderson Wetlands Protection Act of 1984 shall be acceptable when permits have been approved and copies have been provided to the department.

7. The department may allow other shoreline treatments to achieve appropriate safety and environmental considerations.

8. Each water body shall have a perimeter greenbelt of vegetation or berm

designed to retain the first one inch of runoff. The greenbelt shall consist of tree and shrub species, in addition to ground cover. The berm shall be set back from the edge of the water body so that it does not interfere with the other requirements of paragraph (a).

9. The operator shall restore the original drainage pattern of the area to the greatest extent practical and shall approximate the original watershed boundaries.

10. All waters of the state on or leaving the property under control of the operator shall meet applicable water quality standards of the Florida Department of Environmental Protection.

11. Water within all wetlands and water bodies shall be of sufficient quality to allow recreation or support fish and other wildlife.

(b) Reclamation shall achieve the stormwater requirements of the appropriate water management district.

(5) Contouring.

(a) The final slopes of all reclaimed uplands shall not be steeper than four horizontal feet for each vertical foot, unless a steeper slope existed in that area prior to mining or the reclaimed slope is on a final highwall.

1. In areas where the premining slope was steeper than four to one, the reclaimed slope shall be no steeper than the premining slope.

2. The reclaimed slopes of final highwalls shall be no steeper than three horizontal feet for each vertical foot, unless approved by the department. The department's determination shall be based on a slope stability study prepared by a registered engineer experienced in geotechnical engineering and submitted by the operator. The department shall approve steeper slopes when the study clearly demonstrates the long-term stability of such a slope in that location and the study is consistent with the recommendations in the "Study of Slope Stability for Reclaimed Highwalls in North Florida," prepared by the University of Florida in 1986, available from the department's Bureau of Mine Reclamation and hereby incorporated by reference.

(b) Reclamation and restoration shall result in landforms which are capable of supporting diverse and beneficial land uses.

(6) Erosion. The operator shall use best management practices to minimize erosion, including revegetation.

(a) The use of good quality topsoils is encouraged, especially in areas reclaimed for aquatic or wildlife habitats.

(b) Where topsoil is not used, the operator shall use a growing medium acceptable to the department for the type of vegetative communities planned.

(c) Where possible, long, continuous slopes should be avoided.

(d) Mulching, contouring, and other suitable techniques shall be used to enhance stabilization. Should washes or rills develop after revegetation and before final release of the area, the operator shall repair the eroded areas and stabilize the

slopes by a method approved by the department.

(7) Revegetation.

(a) Reclamation shall provide for the establishment of flora and fauna which are consistent with the intended land use.

1. The operator shall develop a plan for the proposed revegetation, including the species of grasses, shrubs, trees, and aquatic and wetland vegetation to be planted, the spacing of vegetation, and, where necessary, the program for treating the soils to prepare them for revegetation.

2. Except as provided below, all uplands must have an established ground cover for a period of at least one year after planting over 80 percent of the reclaimed upland area, excluding roads, groves, or row crops. Bare areas shall not exceed one-quarter (1/4) acre.

3. All species used for revegetation shall be native to the area, except for grasses that are used to establish a vegetative cover rapidly and help prevent erosion.

4. Forested areas shall be established where consistent with proposed land uses. At a minimum, 10 percent of the upland and littoral zone areas shall be revegetated as forested areas with at least three species of indigenous hardwoods and conifers. Of the total number of trees planted, at least one third must be hardwoods, at least one third must be conifers, and none of the three required species shall constitute less than ten percent. An area will be considered to be reforested if a stand density of 200 trees per acre is achieved at the end of one year after planting.

5. Herbaceous wetlands shall be planted or otherwise treated to achieve a ground cover of at least 50 percent within one year of the initial planting or establishment and shall be protected from grazing, mowing, or other adverse land uses for two years to allow further establishment.

6. Wooded wetlands shall be planted to achieve a stand density of 200 trees per acre within one year of the initial planting.

7. All wetland areas shall be revegetated in accordance with the best available technology.

(b) The plans for revegetation shall incorporate measures to offset wildlife habitat lost as a result of fuller's earth extraction.

1. The operator shall identify what measures have been incorporated into the conceptual plan to offset fish and wildlife values lost as a result of mining activities and shall identify special programs to restore, enhance, or reclaim particular habitats, especially for endangered and threatened species, as identified by the Florida Game and Fresh Water Fish Commission or the U. S. Fish and Wildlife Service.

2. The operator may designate specific locations within the mine as "Wildlife Areas" and include a plan for reclamation and management for sites so designated. Slopes, revegetation, and erosion control requirements may be waived or modified by the department in such areas on a case-by-case basis where such changes will benefit the overall plan for the propagation of wildlife.

(8) Exceptions. Exceptions to the criteria and standards contained in this section may be granted by the department for experimental or innovative techniques.
Specific Authority 211.32, 370.021, 378.404 FS. Law Implemented 211.32, 378.404(8), 378.703 FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.008.

62C-38.009 Inspections. (REPEALED)
Specific Authority 370.021, 378.404 FS. Law Implemented 378.407 FS. History--New 3-19-87, Repromulgated 11-29-90, Formerly 16C-38.009, Repealed 10-20-96.

62C-38.010 Release Procedures.

(1) Upon completion of reclamation requirements in an area, the operator shall notify the department and provide a map which specifically delineates the completed area.

(2) Within 60 days after receipt of the notification, the department shall notify the operator in writing whether or not an inspection will be made within one year after receipt of the operator's notification. The department's notification shall include the date the inspection will occur, if an inspection is scheduled.

(3) Within 30 days after the inspection, the department shall notify the operator in writing that the area is released or what work must be done before release can be granted.

(4) If the department notifies the operator that the area will not be inspected, the area shall be released from reclamation requirements at the end of the second year after receipt of the operator's notification.

(5) If an operator wishes to resume mining operations within a released area, the area to be disturbed shall be considered to be an undisturbed area for the purposes of this chapter and notification shall be made in accordance with the full provisions of this chapter.
Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(8) FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.010.

62C-38.011 Annual Reports.

(1) On or before March 1 of each year, each operator shall submit to the department a report for the previous calendar year for each mine under his control. Each report shall be submitted in accordance with the document format and standards in section 62C-38.004 and shall include:

(a) Name and address of the operator, name of the mine, and year covered by the report.

(b) The number of acres from which overburden was completely removed during the year and the volume of overburden removed during the year, including overburden between clay layers and noncommercial fuller's earth that will not be removed from the mine area.

(c) The number of acres from which fuller's earth was completely extracted and the depths to which mining occurred during the year.

(d) The number of acres initially disturbed, because of mining related activities, but not mined, during the year and the nature of the disturbances.

(e) A description of the reclamation activities that have taken place during the last calendar year.

(f) Maps that illustrate paragraphs (b) through (e) above. To the extent possible, maps submitted with the second or each successive report shall include the information shown on maps submitted with previous reports.

(g) A list of all changes in the conceptual plan for the report period that are not believed to be significant, including changes in the status of any required permits.

(2) The department shall examine each annual report and notify the operator of any apparent errors or omissions, in accordance with section 62C-38.006.

(3) The operator shall respond to the department's request for corrections of errors and omitted information within 60 days of receipt.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1), (8) FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.011.

62C-38.012 Violations, Injunctive Relief, and Penalties.

(1) Upon determination by the department that an operator is in violation of any requirement of this chapter, he shall notify the operator in writing by certified mail of the nature of the violation and specify dates by which corrective action shall begin and be completed.

(2) If the operator fails to take corrective action as specified in the notice of violation, the department may institute civil action in a court of competent jurisdiction to seek injunctive relief to enforce compliance with the requirements of this chapter and to impose and recover any civil penalty allowed by section 370.021, F. S.

(3) Any operator who begins resource extraction without meeting the requirements of this chapter is liable, pursuant to section 378.409, F. S., to the state for any damages.

Specific Authority 370.021, 378.404 FS. Law Implemented 370.021, 378.408, 378.409 FS. History--New 3-19-87, Amended 11-29-90, Formerly 16C-38.012.

62C-38.013 Donations of Land. (REPEALED)

Specific Authority 370.021, 378.404 FS. Law Implemented 211.32, 253.02 FS. History--New 3-19-87, Repromulgated 11-29-90, Formerly 16C-38.013, Repealed 10-20-96.

62C-38.014 Forms.

The following forms are available from the department's Bureau of Mine Reclamation and are incorporated by reference:

(1) Form 1. Notice of Intent to Mine Fuller's Earth, Fuller's Earth Form 1, DNR

53-039(16), effective 11/90.

(2) Form 2. Fuller's Earth Mine Conceptual Reclamation Plan Modification, Fuller's Earth Form 2, DNR 53-040(16), effective 11/90.

(3) Form 3. Fuller's Earth Mine Annual Mining and Reclamation Report, Fuller's Earth Form 3, DNR 53-041(16), effective 11/90.

(4) Form 4. Fuller's Earth Mine Notice of Cessation of Mining Operations, Fuller's Earth Form 4, DNR 53-042(16), effective 11/90.

(5) Form 5. Fuller's Earth Mine Reclamation Release Request, Fuller's Earth Form 5, DNR 53-043(16), effective 11/90.

(6) Form 6. Fuller's Earth Mine Temporary Land Use Request, Fuller's Earth Form 6, DNR 53-044(16), effective 11/90.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1) - (2), 378.701(3) FS. History--New 11-29-90, Formerly 16C-38.014.

CHAPTER 62C-39
RECLAMATION REQUIREMENTS FOR SOLID RESOURCES OTHER THAN PHOSPHATE, LIMESTONE, HEAVY MINERALS, AND FULLER'S EARTH

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62C-39.001 Intent and Applicability. (REPEALED)

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404, 378.412, 378.804 FS. History--New 1-19-89, Formerly 16C-39.001, Repealed 10-20-96.

62C-39.002 Definitions.

For the purpose of this chapter, the following words and terms shall have the definitions and meanings ascribed to them in this section:

(1) "Agency" means an official, committee, department, commission, officer, division, authority, bureau, council, board, section, or unit of government within the state, including a county, municipal, or other local or regional entity or special district.

(2) "Bureau" means the Bureau of Mine Reclamation, 2051 East Dirac Drive, Tallahassee, Florida 32310.

(3) "Certified" means approved by the executive director to administer the requirements of this chapter. This term shall only apply to the Department of Transportation or a local government.

(4) "Department" means the Department of Environmental Protection, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399.

(5) "Executive director" means the chief administrative officer of the department or his designee.

(6) "Existing mine" means any mine upon which an operation is being conducted, or has been conducted, on October 1, 1986.

(7) "Extraction" means the removal of resources from their location, so as to make them suitable for commercial, industrial, or construction use; but does not include excavation solely in aid of on-site farming or on-site construction, nor the process of searching, prospecting, exploring, or investigating for resources.

(8) "Local government" means any county or municipality.

(9) "Mine" means an area of land upon which mining operations have been conducted, are being conducted, or are planned to be conducted, as the term is commonly used in the trade.

(10) "New mine" means any mine that is not an existing mine.

(11) "On-site" means within the contiguous limits of an area of land under one ownership or control and upon which farming or construction activities are taking place. Areas of land that are divided by public or private roads are considered contiguous if such areas are under one ownership or control.

(12) "Operation" means any activity, other than prospecting, necessary for site preparation, extraction, waste disposal, storage, or reclamation.

(13) "Operator" means any person engaged in an operation.

(14) "Overburden" means soil and rock removed to gain access to the resource in the process of extraction and means such soil or rock before or after its removal. This does not include tailings or screenings generated by processing the resource.

(15) "Phosphate" means phosphate resources that are subject to chapter 211, part II, Florida Statutes.

(16) "Reclamation" means the reasonable rehabilitation of land where resource extraction has occurred.

(17) "Resource" means soil, clay, peat, stone, gravel, sand, metallic ore, or any other solid substance, except phosphate, limestone, heavy minerals, and fuller's earth, of commercial value found in natural deposits on or in the earth.

(18) "Sand" means any loose, granular material that could be sold commercially as sand.

(19) "Slope" means the ratio of a horizontal distance to one corresponding unit of vertical distance.

(20) "Spoil" means soil and rock removed to gain access to the resource or left as waste in the process of extraction. This does not include tailings or screenings generated by processing the resource.

(21) "Wetlands" means any area having dominant vegetation as defined and listed in Department of Environmental Protection Rule 62-301.400, Florida Administrative Code, regardless of whether the area is within the Department of Environmental Protection's jurisdiction or whether the water bodies are connected. Specific Authority 370.021, 378.404 FS. Law Implemented 378.403, 378.404 FS. History--New 1-19-89, Formerly 16C-39.002.

62C-39.003 Notices and Information Required.

(1) New Mines. Operators of new mines shall notify the executive director of their intent to mine or their commencement of mining operations, as follows:

(a) Subsequent to the effective date of this rule, no operator may begin the process of extraction at a new mine without notifying the executive director of the intent to mine at least 30 days prior to the beginning of mining operations. The notice shall include the information required in subsection (3) below.

(b) For those mines where extraction began after January 1, 1987, and on or before the effective date of this rule, notices of mining shall be provided within 60 days of the effective date of this rule.

(2) Existing Mines. By January 1, 1989, operators of existing mines shall provide the executive director with a notice of mining which contains the information required in subsection (3) below. Notices of mining are not required for existing mines where no operations will occur after January 1, 1989.

(3) Information Required. The following information shall be included as part of the notice of intent to mine or mining, whichever is applicable, for each mine subject to this rule. This information shall be submitted in the form of an executed copy of DNR Form 53-031(16), incorporated by reference in section 62C-39.014.

(a) Operator's name, mailing address, street address, and phone number.

(b) Name of parent company or corporation, mailing address, street address, and phone number.

(c) Authorized agent's name, mailing address, street address, and phone number.

(d) A list of each mine covered by the notice of intent to mine or mining; a description of the location of each mine, including the county, township, range, and section; and a recent aerial photograph that clearly indicates the location of each existing or future mine. Aerial photographs obtained from the county property appraiser's office, a commercial source, or through the Department of Transportation, Bureau of Topography, shall be acceptable.

(e) Resource to be extracted and mine acreage.

(f) A list of mining or reclamation permits known to be required, the permitting agency, and the status of each permit.

(g) The estimated life of the mine to the nearest year for each mine covered by the notice of intent to mine or mining.

(h) A signed acknowledgment of the reclamation performance standards in section 62C-39.008.

(4) Cessation of Operations.

(a) An operator shall notify the executive director within 30 days following a temporary or permanent cessation of mining at a mine except when the temporary cessation period is less than 12 months. Such notice may be verbal or in writing. If notice is provided in writing, the use of DNR Form 53-033(16) is suggested, but not required. (b) An operator shall notify the executive director of any other changes to information supplied with the notice of mining within 60 days of determining the change. Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1), (2), (8), 378.801, 378.802 FS. History--New 1-19-89, Formerly 16C-39.003.

62C-39.004 Document Format and Standards.

The use of standardized forms referenced in this rule is required to insure that all requests that require agency action are handled in an efficient and expeditious manner. Additional pages needed to complete each form shall conform to the standards in this section. The number of copies to be submitted shall be specified on each form. The following standards shall apply:

(1) All copies of documents shall be of good quality and clearly legible.

(2) All documents that are to be signed shall bear an original signature.

(3) All written documents shall be submitted in an 8 1/2- by 11-inch format with a minimum margin of one inch on all sides. Original maps, drawings, and aerial photographs may be larger than 8 1/2 by 11 inches.

(4) All notices, maps, aerials, etc. shall include the date prepared or revised.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1), (2) FS. History--New 1-19-89, Formerly 16C-39.004.

62C-39.006 Agency Review Procedures.

All agency reviews shall be conducted as follows:

(1) Within 30 days after receipt of an operator's notice of mining, notice of changes, or other required information, the executive director shall review the notice or required information and shall request the submittal of any additional information required by the rules.

(2) The operator shall provide the additional information requested within 45 days of receipt of the request or shall request an extension of the 45-day period. The extension request shall include the date by which the information can be provided and the reason for the extension. The executive director shall approve reasonable requests for extensions that are based on the need of the operator to complete data collection.

(3) If the operator believes any agency request for additional information is not authorized by law or agency rule, the operator may request a hearing pursuant to section 120.57, Florida Statutes.

(4) Within 30 days after receipt of the requested additional information, the agency shall review it and may further request only such information needed to clarify the additional information.

(5) If the operator believes the request of the agency for such additional information, requested pursuant to subsection (4) above, is not authorized by law or agency rule, the agency, at the operator's request, shall proceed with its review based on the information furnished.

(6) The executive director shall notify the operator as to whether or not the notice or required information is in compliance with this chapter within 90 days after receipt of the original notice or required information or after receipt of the last item of timely requested additional information, whichever is later. If the operator makes written request to begin processing the notice or required information, the 90 days shall begin upon receipt of the written request.

Specific Authority 378.404 FS. Law Implemented 378.404(3), 378.405 FS. History--New 1-19-89, Formerly 16C-39.006.

62C-39.007 Confidentiality and Availability of Records.

(1) All information received by the agency shall be handled, with respect to confidentiality in compliance with section 378.406, Florida Statutes.

(2) Each original page of all confidential documents shall be stamped by the operator with the word CONFIDENTIAL in bold red letters.

(3) The legal basis for the confidentiality of any information shall be provided as a cover statement for all documents containing confidential information.

(4) All information received from the operator, except as provided in subsection 378.406(1), Florida Statutes, shall be available for public inspection and duplication, pursuant to subsection 378.406(2), Florida Statutes.
Specific Authority 370.021, 378.404 FS. Law Implemented 378.406 FS. History--New 1-19-89, Formerly 16C-39.007.

62C-39.008 Reclamation Standards.

The Department is authorized to inspect all mines subject to this rule to determine compliance with rule requirements and to determine if reclamation has been properly completed thereby allowing the release of the operator from further obligations. The following standards shall apply to all areas disturbed by mining operations in new mines and all new surface areas disturbed after January 1, 1989, at existing mines.

(1) Completion Dates for Reclamation Activities. All reclamation activities shall, to the extent possible, be coordinated with resource extraction and in any event shall be initiated at the earliest practicable time.

(a) Contouring shall be initiated and completed no later than one year after the calendar year in which mining operations cease for any given area. The executive director shall waive this requirement for any reasonable length of time when a waiver is necessary to prevent the unacceptable contamination of the resource being extracted.

(b) Revegetation activities shall be initiated as soon as practical and completed no later than one year after the calendar year in which the final contours are established in an area unless revegetation activities will interfere with mining operations.

(c) Reclamation activities through revegetation shall be completed within three years of the cessation of mining operations at the mine.

(d) If mining operations temporarily cease at a mine for more than 12 months, the operator shall comply with one of the following options:

1. The requirements of subsections (4) -- (7) below shall begin immediately and be completed at a rate of at least 1000 feet of shoreline or dry pit wall per three-month period; or

2. The operator shall post a bond or other surety in an amount reasonably related to the cost of completing reclamation and for the period of time the initiation of reclamation will be delayed, both of which shall be acceptable to the executive director; or

3. The operator shall begin reclaiming an equivalent amount of nonmandatory land at the rate specified in subparagraph 1. above. Compliance with the above requirements shall be tolled by the length of time that a temporary cessation results from attempts to obtain necessary permits for operations. The executive director shall waive the commencement of the above requirements for any length of time not to

exceed a maximum of one year upon a showing of good cause by the operator.

(e) If mining operations cease, for whatever reason, for more than two years at a mine, then all of the requirements of this section shall be met. This period shall be extended for a maximum of five years when the cessation of mining is caused by governmental action during the review of environmental permit applications. However, the executive director shall direct the operator to complete those reclamation activities necessary to protect the public health and safety.

(f) The requirements of paragraphs (d) and (e) above shall be suspended upon the resumption of mining.

(2) Consistency with Local Ordinances. Reclamation activities shall be consistent with all applicable local government ordinances at least as stringent as the criteria and standards contained in this section.

(3) Surface Drainage and Groundwater Requirements. Reclamation shall achieve the stormwater drainage, wetlands, and other surface and groundwater management requirements of the Department of Environmental Protection and the appropriate water management district.

(4) Safety. Provisions for safety to persons, wildlife, and adjoining property must be provided.

(a) Site cleanup.

1. All lands shall be reclaimed to a neat, clean condition by removing or adequately burying, where allowed by law, all visible debris, litter, junk, worn-out or unuseable equipment or materials, as well as all poles, pilings, and cables.

2. Large rocks and boulders shall be placed at the base of pit walls to the extent practical to provide fill for establishing acceptable slopes; otherwise, they shall be placed in common locations at the surface or buried to a minimum depth of four feet.

(b) Structures. All temporary buildings, pipelines, and other man-made structures shall be removed with the exception of those that are of sound construction with potential uses that are compatible with the reclamation goals.

(5) Final Slopes. The final slopes shall be such an angle as to minimize the possibility of slides and shall not exceed the natural angle of repose of the material being mined.

(a) The reclaimed slope shall be no steeper than two horizontal feet to one vertical foot, unless the operator chooses to calculate the slope by one of the following acceptable methods:

1. If the material being mined is sand, the maximum reclaimed slope shall be calculated using the angle of repose of the product stockpile. The angle of repose is defined as the slope angle of the product stockpile measured along an undisturbed portion of the pile. Given a vertical component of one unit, the corresponding minimum horizontal component of the reclaimed slope shall be calculated by dividing 1.5, the minimum acceptable factor of safety, by the tangent of the angle of repose of the sand

stockpile.

2. For all other resources, the steepest reclaimed slope shall be calculated by determining the angle of repose of the actual material being mined and applying a minimum factor of safety of 1.5. The angle of repose and the factor of safety shall be determined using standard geotechnical engineering practices.

(b) In mines resulting in lakes the reclaimed slope shall extend from the top of the mine wall to a depth of five feet below the water surface and shall not exceed the steepest slope allowed by (a) above.

(6) Contouring and Erosion Prevention. Any overburden and spoil shall be left in a configuration which is in accordance with accepted soil conservation practices and which is suitable for the proposed future use of the land.

(a) All upland areas disturbed by mining operations must be revegetated in quantities and densities necessary to prevent and control erosion and to provide stability to the slope. Erosional areas shall be repaired until a vegetative cover is fully established and the land is released.

(b) The zone of fluctuation of reclaimed lakes should be vegetated with native wetland species. Acceptable methods recommended to establish vegetation include spreading muck obtained from areas containing desirable, native, littoral zone plant communities, planting of native wetland vegetation, or natural regeneration of wetland plant species. At least 50 percent of the zone should have established vegetation for a period of not less than one year after the initial appearance or planting of the vegetation.

(7) Water Quality. Reclamation shall be designed to avoid the collection of water in pools which are, or are likely to become, noxious, odious, or foul. Where water bodies result from reclamation, the department encourages designs that will allow both a variety of emergent habitats and naturally fluctuating water levels.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(8), 378.802, 378.803 FS. History--New 1-19-89, Formerly 16C-39.008.

62C-39.009 Inspections.

(1) Inspections shall be conducted pursuant to section 378.407, Florida Statutes.

(2) Certification, pursuant to section 378.411, Florida Statutes, shall not preempt the right of the department's staff to carry out inspections pursuant to section 378.407, Florida Statutes.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.407 FS. History--New 1-19-89, Formerly 16C-39.009.

62C-39.010 Release Procedures.

(1) Upon completion of reclamation requirements in an area, the operator shall notify the executive director and provide a map which specifically delineates the

completed area. The notice shall be an executed copy of DNR Form 53-032(16), incorporated by reference in section 62C-39.014.

(2) Within 60 days after receipt of the notification, the executive director shall notify the operator in writing as to whether or not an inspection will be made. The executive director's notification shall include the date the inspection will occur if an inspection is scheduled.

(3) Within 30 days after the inspection, the executive director shall either release the completed area from further reclamation requirements or give written notice to the operator of the deficiencies which must be corrected before a release can be granted.

(4) If the executive director notifies the operator that the area will not be inspected, the area shall be released from reclamation requirements at the end of the second year after receipt of the operator's notification.

(5) If an operator wishes to resume mining operations within a released area, the area to be disturbed shall be considered to be an undisturbed area for the purposes of this chapter and notification shall be made in accordance with the full provisions of this chapter.

Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(8) FS. History--New 1-19-89, Formerly 16C-39.011.

62C-39.012 Violations, Injunctive Relief, and Penalties.

(1) Upon determination by the executive director that an operator is in violation of any requirement of this chapter, he shall notify the operator in writing by certified mail of the nature of the violation and specify the dates by which corrective action shall begin and be completed.

(2) If the operator fails to take corrective action as specified in the notice of violation, the executive director may institute civil action in a court of competent jurisdiction to seek injunctive relief to enforce compliance with the requirements of chapter 378, part IV, Florida Statutes, and to impose and recover any civil penalty allowed by section 120.69, Florida Statutes.

(3) Any operator who begins resource extraction without meeting the requirements of chapter 378, part IV, Florida Statutes, shall be liable to the state for any damages suffered, as provided in section 378.409, F. S.

Specific Authority 370.021, 378.404 FS. Law Implemented 120.69, 378.408, 378.409 FS. History--New 1-19-89, Formerly 16C-39.012.

62C-39.013 Severance Taxpayers and Multiple Resource Operators.

(1) Severance Taxpayers. Any operator who is subject to the severance tax provision of chapter 211, part II, Florida Statutes, shall meet or be subject to the following additional requirements or provisions:

(a) Reclamation and restoration plans previously approved by the department

shall be carried out, as approved, unless the operator seeks changes pursuant to this chapter.

(b) All applications, except conceptual reclamation plans, required by chapter 62C-16, F. A. C., received prior to October 1, 1986, that are on file with the department and not required by this chapter shall be considered withdrawn on the effective date of this chapter.

(c) The review of unapproved conceptual reclamation plans filed under chapter 62C-16, F. A. C., shall be completed in accordance with section 62C-39.006, F. A. C., unless withdrawn by the applicant.

(d) For the purposes of this section, the following definitions shall apply:

1. "Program" shall mean a reclamation plan that is approved by the executive director and is consistent with the reclamation standards in section 62C-39.008.

2. "Other qualified sites" shall mean sites other than the site of severance that meet the following qualifications:

a. The restoration or reclamation of the site and the program to be instituted are in the public interest; and

b. The location of the site is in an area where economic considerations would not be conducive to immediate restoration or reclamation of the site.

(e) On or before April 1 of each year, each operator shall submit to the executive director a report for the previous calendar year for each mine under its control that is subject to the severance tax. Each report shall be submitted on the DNR Form 53-034(16), incorporated by reference in section 62C-39.014, F. A. C., and shall include the following for the report period:

1. Name and address of the operator, name of the mine, and year covered by the report.

2. The number of acres upon which resource extraction occurred which was subject to the severance tax.

3. The total number of acres for which refunds are being requested for reclamation activities.

4. A map that shows the location of the site of severance and the area where reclamation activities occurred for which refunds are being sought.

5. A description of the reclamation activities for which a refund is being sought.

(f) As part of accomplishing the reclamation of any site that is eligible for refunds under section 211.32, Florida Statutes, an operator may request that the department accept a portion or portions of the site as state land. Such a request shall be in writing to the executive director and shall be accompanied by an offer to transfer to the state title to the land involved and suitable ingress thereto and egress therefrom.

(2) Multiple Resource Operators. If an operator is engaged in extracting more than one resource from the same mine, the operator shall be subject to the requirements of the rule chapter, specifically, 62C-16, 16C-36, 62C-37, 16C-38, or

16C-39, that regulates the particular mineral resource which was extracted in the largest volume.
Specific Authority 370.021, 211.32, 378.404 FS. Law Implemented 211.32, 378.404(1) FS. History--New 1-19-89, Formerly 16C-39.013.

62C-39.014 Forms.

The following forms are available from the bureau and are incorporated herein by reference:

(1) Notice of Intent to Mine or Mining Other Resources, Other Resources Form 1, DNR 53-031(16), effective 1/89.

(2) Other Resources Mine Reclamation Release Request, Other Resources Form 2, DNR 53-032(16), effective 1/89.

(3) Other Resources Mine Notice of Cessation of Mining Operations, Other Resources Form 3, DNR 53-033(16), effective 1/89.

(4) Other Resources Mine Annual Severance Taxpayer's Report, Other Resources Form 4, DNR 53-034(16), effective 1/89.
Specific Authority 370.021, 378.404 FS. Law Implemented 378.404(1), (2) FS. History--New 1-19-89, Formerly 16C-39.014.

CHAPTER 62C-17
MASTER RECLAMATION PLAN FOR LANDS DISTURBED BY THE SEVERANCE OF PHOSPHATE PRIOR TO JULY 1, 1975

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62C-17.001 Intent. (REPEALED)

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.031 FS. History--New 3-24-82, Amended 1-10-85, Formerly 16C-17.01, 16C-17.001, Repealed 10-20-96.

62C-17.002 Definitions.

The following words and terms shall have the definition and meaning ascribed to them in this section:

(1) "Approved Reclamation Program" shall mean a reclamation program which has been approved by the Department.

(2) "Bureau" shall mean the Department's Bureau of Mine Reclamation, Division of Resource Management, 2051 East Dirac Drive, Tallahassee, FL 32310-3760.

(3) "Clay Settling Area", for purposes of the reimbursement provisions of these rules, shall mean an area completely enclosed by and including an earthen dam used for waste clay disposal.

(4) "Committee" shall mean the Nonmandatory Land Reclamation Committee.

(5) "Commodity" shall mean any of the various supplies, materials, goods, merchandise, equipment and other personal property purchased, leased or otherwise contracted for by the Landowner for the purpose of performing the approved reclamation activities.

(6) "Contractual Service" shall mean the rendering by a contractor, engineer, surveyor or any other provider of a service of its time and effort rather than the furnishing of specific commodities.

(7) "Department" shall mean the Governor and Cabinet sitting as the head of the Department of Environmental Protection, 3900 Commonwealth Boulevard, Tallahassee, Florida 32303.

(8) "Dewatering Phase" shall mean the work effort put forth to remove surface waters from clay settling areas by the use of spillways, and the partial removal of combined waters from waste clay by the use of ditches to facilitate and promote the drying and crusting of waste clays. This phase includes disturbance of the earthen dams surrounding the pond for dewatering and breaching of the dam for abandonment.

(9) "Earthmoving Stage" shall mean that period of time which extends from initiation of reclamation activity to and including final contouring of the landform to the point at which the Bureau certifies the earthmoving complete and at which point revegetation would normally occur.

(10) "Eligible Lands" means those lands mined or disturbed by the severance of phosphate rock prior to July 1, 1975, and included as eligible lands in the master reclamation plan adopted pursuant to Section 378.021, F. S.

(11) "Eligible Parcel" shall mean those parcels mined or disturbed by the severance of phosphate rock, prior to July 1, 1975, which have been evaluated and determined to qualify for reimbursement grant funding, pursuant to Chapter 378,

Florida Statutes, and Chapter 62C-17, F. A. C.

(12) "Establishment Stage" shall mean the period of time, after the Bureau has certified the revegetation complete, required to determine the probable survival of vegetative plantings -- normally one year. This term shall also include approved erosion and vegetation maintenance activities.

(13) "Evaluation Methodology" shall mean the procedures used for the determination of parcel eligibility as set forth in the Report, "Evaluation of Pre-July 1, 1975, Disturbed Phosphate Lands."

(14) "Executive Director" shall mean the chief administrative officer of the Department of Natural Resources.

(15) "Finger Lakes" shall mean those elongate, parallel waterbodies, normally resulting from the reclamation of a mined-out area, separated in whole or in part by narrow uplands in such a way that their parallel elongate appearance is preserved.

(16) "Initiation of Reclamation Activity" shall mean the beginning of physical earthmoving or the activities necessary to achieve abandonment of a dam within the approved reclamation program boundaries.

(17) "Landowner" shall mean the title holder of record of the affected land or the agent for the title holder of record provided written authorization designating the agent and the specific scope of the agent's authority is on file with the Bureau.

(18) "Mined-out Area", for purposes of the reimbursement provisions of these rules, shall mean all eligible lands other than clay settling areas.

(19) "Nonmandatory Lands" shall have the meaning set forth in Subsection 378.032(8), Florida Statutes. Lands which are put into use after July 1, 1984, as a clay settling area or a dam for use with a clay settling area are not included as nonmandatory lands unless such lands were used for clay disposal between July 1, 1975, and July 1, 1984.

(20) "Other Landforms", for the purposes of the reimbursement provisions of these rules, shall mean those parcels defined and identified in the Report as "Hydraulically Mined Areas", "Sand Tailings Areas" and "Other Areas" such as abandoned plant sites, mine roads, railroad rights-of-way, ditches and canals.

(21) "Parcel" shall mean a unit of disturbed land which is similar in landform and postdisturbance age and has been defined and identified by a unique number by the Bureau.

(22) "Parcel Evaluation" shall mean the examination of the physical features and conditions of a parcel pursuant to the evaluation methodology.

(23) "Prereclamation Application" shall mean a request by a Landowner for a nonbinding review of a proposed reclamation program, donation or purchase of an eligible parcel(s).

(24) "Primarily engaged in the mining or processing of phosphate ores" shall mean any company or corporation that is or has in the past engaged in the mining or processing of phosphate ores within the State of Florida.

(25) "Program Site" shall mean the parcel of land defined by a legal description and included in a reclamation program or reclamation program application.

(26) "Put Into Use" shall mean the date a clay settling area first receives waste clay material.

(27) "Reclaimed Landform" shall mean uplands, submerged lands, or wetlands included in or established under an approved reclamation program.

(28) "Reclamation Contract" shall mean the agreement entered into between the Department of Environmental Protection and the Landowner to implement the Landowner's approved reclamation program.

(29) "Reclamation Program" shall mean a specific reclamation proposal on an eligible parcel or portion of an eligible parcel presented by a Landowner.

(30) "Reclamation Program Application" shall mean any application for reclamation, donation, or purchase of an eligible parcel.

(31) "Report" shall mean the "Evaluation of Pre-July 1, 1975, Disturbed Phosphate Lands," August 1980, including the Appendices and Map Book.

(32) "Revegetation" shall mean the providing of a diverse permanent vegetation, indigenous to the State, capable of self-regeneration which within a reasonable time will provide the appearance of a natural landscape. This term shall also include erosion control grasses.

(33) "Revegetation Stage" shall mean the period of time during which approved revegetation is normally done and extends from the date the Bureau certifies the earthmoving complete to the date the Bureau certifies the revegetation complete.

(34) "Staff" shall mean employees of the Bureau.

(35) "Substantial Completion" shall mean the point at which the Bureau certifies the revegetation complete.

(36) "Wetlands" shall mean the various types of habitats and vegetative communities which exist where the water table is at or above grade for portions of the year and shall include forested wetlands such as hardwood swamps, cypress swamps and domes, and nonforested wetlands such as wet prairies and freshwater marshes.

(37) "Year" shall mean the fiscal year of the State of Florida.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.032 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.02, Amended 12-25-86, 6-13-91, Formerly 17C-17.002.

62C-17.003 Incorporation by Reference of the Evaluation Methodology, Identification and Parcelization of Lands and Results of Evaluation of Parcels.

(1) The Report of the Department of Environmental Protection entitled, "Evaluation of Pre-July 1, 1975 Disturbed Phosphate Lands," August, 1980, including the Appendices and Map Book (henceforth referred to as the "Report"), is hereby incorporated into these rules to the extent that it:

(a) Identifies the lands subject to these rules;

(b) Subdivides these lands into parcels for evaluation purposes;

(c) Sets forth the methodology for evaluating the parcels for reclamation;

(d) Provides a summary of the evaluation of each parcel; and

(e) Identifies those parcels determined eligible for consideration of reclamation reimbursement grant funding on the basis of the evaluation of the physical characteristics of the parcel.

(2) Notwithstanding the conclusions of the Report, the Bureau, pursuant to Section 62C-17.004 and paragraphs 62C-17.003(1)(a), (b), and (c), has reevaluated the parcels below and has concluded that the eligibility characteristics of the parcels are as follows:

Parcel Identification	Status	Eligibility Landform
AGR-SC-O7	Eligible	Mined Out Area
Highland Village	Ineligible	Mined Out Area
Wayne Thomas 'M'	Ineligible	Mined Out Area
Agri-Leis-O1	Ineligible	Mined Out Area
Agri-Leis-O2	Ineligible	Mined Out Area
EGC-SC-F	Ineligible	Gypsum Disposal
BP-L-O1	Ineligible	Mined Out Area
BP-L-O2	Ineligible	Mined Out Area
Alva Carver	Ineligible	Mined Out Area
M. C. Leetun	Ineligible	Mined Out Area
Christina Commercial	Ineligible	Mined Out Area
EGC-SC-C	Eligible	Mined Out Area

(3) A copy of this report is on file with the Secretary of State. Copies may be obtained from the Bureau of Mine Reclamation, at cost of reproduction, postage, and handling.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.038 FS. History--New 3-24-82, Amended 1-10-85, Formerly 16C-17.03, Amended 6-13-91, 11-11-93, Formerly 16C-17.003.

62C-17.0035 Eligibility of Parcels.

(1) The Department will presume that a property is eligible or ineligible to participate in this program from the perspective of site characteristics based on the conclusions contained in the Report.

(2) Notwithstanding the presumption of eligibility set forth in subsection (1) above, the Department will presume that the following lands are not eligible to participate in this program;

(a) Lands included in a reclamation program approved by the Department pursuant to Chapter 211, Part II, F. S., and subsequently determined to be abandoned pursuant to Chapter 211, Florida Statutes,

(b) Any lands included in a reclamation program approved by the Department pursuant to Chapter 211, Part II, Florida Statutes, on or after July 1, 1978, and which have not been or will not be withdrawn from the approved reclamation program, and

(c) Any lands put into use as a clay settling area or dammed for use with a clay settling area after July 1, 1984.

(3) Additional lands disturbed by the severance of phosphate rock prior to July 1, 1975, may be determined eligible or ineligible through Bureau re-evaluation or evaluation of a Request to Evaluate the Status of Disturbed Lands, as more fully set out in Rule 62C-17.004, F. A. C.

(4) Lands otherwise eligible but which have been included in a mitigation agreement resulting from a breach or alleged breach of either a reclamation program approved by the Department or any provision of Rule 62C-16, F. A. C., are excluded from participation in this program.

Specific Authority 378.021, 378.034, 378.038, 370.021 FS. Law Implemented 378.021, 378.034, 378.036, 378.038 FS. History--New 3-24-82, Amended 1-10-85, Formerly 16C-17.035, Amended 12-25-86, Formerly 16C-17.0035.

62C-17.0038 Parcel Inventory. (REPEALED)

Specific Authority 378.021, 378.034, 378.038, 370.021 FS. Law Implemented 378.034 FS. History--New 11-11-93, Formerly 16C-17.0038, Repealed 10-20-96.

62C-17.004 Reevaluation of Parcels.

(1) The Department recognizes that certain lands identified as being eligible or ineligible to participate in this program based on the conclusions contained in the Report may have changed characteristics since the publication of the Report. Therefore, the Bureau may reevaluate certain nonmandatory lands to determine their current eligibility status. All changes in eligibility, other than lands which have been reclaimed and certified as complete, shall be adopted by rule.

(2) Any Landowner who owns land which has been presumed eligible or ineligible or any substantially affected person, including the Department, may file with the Bureau a Request to Evaluate the Status of Disturbed Lands to rebut the presumption of the status or to determine the status of unevaluated property. Prospective applicants for reclamation of a site shall notify the Bureau of an intent to prepare a reclamation application prior to submittal of the application, for the purpose of permitting the Bureau to review the current status of the site.

(3) A Request to Evaluate the Status of Disturbed Lands shall include at least the following information:

(a) The name and address of the Landowner or other affected person filing the

Request;

(b) The name and address of all persons holding any interests in the property in question;

(c) If the Request concerns reevaluation of property included in a parcel evaluated in the Report, the parcel number used in the Report;

(d) A map showing the location of the property;

(e) A general description of the condition of the property at the time the Request is filed;

(f) A statement of whether the Landowner or the affected person requests the property to be declared eligible or ineligible under the program; and

(g) The facts necessary to support the requested status. Where a property has not been previously evaluated, the statement of facts must include evidence that the property was disturbed by the severance of phosphate rock prior to July 1, 1975.

(4) A Request to evaluate the status of disturbed lands may be filed with the Bureau at any time. Requests for evaluation must be in compliance with subsection 62C-17.004(3) and shall be evaluated within five (5) years of the date the Request is deemed complete. The Request to evaluate shall include physical evidence of changes in or to the site which might indicate a change in eligibility.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.038 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.04, Amended 6-13-91, Formerly 16C-17.004.

62C-17.005 Prioritization of Reclamation Programs.

(1) Reclamation program application prioritization shall be based on the following criteria; however, greater weight shall be given to one or more of the criteria depending on the overall needs of the nonmandatory land reclamation program:

(a) Whether there are existing Category 1, as defined in the Report, health and safety hazards, and if there are, they shall be given the greatest weight;

(b) Whether the economic or environmental utility or the aesthetic value of the land would return naturally within a reasonable period of time;

(c) Whether there is a reasonable geographic and applicant diversity in light of prior awarded reclamation contracts, reclamation program applications before the Committee, and the remaining eligible lands;

(d) Whether reclamation or acquisition is in the public interest;

(e) Whether the land has been naturally reclaimed or is eligible for acquisition by the State for hunting, fishing, or other outdoor recreation purposes, or wildlife preservation;

(f) Whether the land is to be reclaimed for agricultural uses and the applicant has agreed to maintain the lands in agricultural use for at least five (5) years after the completion of reclamation;

(g) Whether the program alone or in conjunction with other reclamation or

acquisition programs will provide a substantial regional benefit;

(h) Whether the reclamation or acquisition program alone or in conjunction with other reclamation programs will benefit regional drainage patterns or is part of an overall reclamation plan identified for environmental land uses or the protection of diverse plant and wildlife communities;

(i) Whether the land is publicly owned and will be reclaimed for public purposes or whether the land is adjacent to or nearby publicly owned lands;

(j) Whether the applicant has demonstrated, by performance, the ability to accomplish quality reclamation in an economical, expeditious, and efficient manner;

(k) Whether the program includes a donation or agreement to sell a portion of the program application area to the State for outdoor recreational or wildlife habitat protection purposes;

(l) Whether the reclamation or acquisition program is cost-effective in achieving the goals of the nonmandatory land reclamation program;

(m) Whether the program will reclaim lands described in Subsection 62C-17.009(5);

(n) Whether the applicant has agreed to maintain the land in conformance with the standards and criteria of this rule and without substantial deviation from the approved program for a period of five (5) years following completion of the reclamation program; and

(o) Whether any endangered or threatened species occupy the reclamation or acquisition program area and the extent to which they will be affected.

(p) Whether the landowner had submitted the notice of intent required by Section 62C-17.0038, F.A.C.

(2) The criteria enumerated in (1) above shall be used to establish two (2) prioritized lists of applications for presentation to the Committee. One list of prioritized applications shall be made up of those reclamation programs to create lands to be actively used for agricultural activities which are submitted by applicants other than corporations primarily engaged in the mining or processing of phosphate ores for which there are available funds under the provisions of (4) below. The other list of prioritized applications shall be made up of all other applications.

(3) Until 1995, the funds each year available for new reclamation contracts and new acquisition of nonmandatory lands shall not exceed twenty percent (20%) of the uncommitted fund balance of the Nonmandatory Land Reclamation Trust Fund at the beginning of each year.

(4) Each year, fifteen percent (15%) of the funds available for new reclamation contracts, as set forth in (3) above, shall be reserved for reclamation programs to create lands to be actively used for agricultural activities which are submitted by applicants other than corporations primarily engaged in the mining or processing of phosphate ores. In the event that, in any given year, there are insufficient applicants that meet this criterion to use the funds reserved under this subsection, the remaining

moneys may be made available to other applicants.
Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.034 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.05, Amended 12-25-86, 6-13-91, 11-11-93, Formerly 16C-17.005.

62C-17.006 Minimum Size Reclamation Program.

(1) To be acceptable for consideration, a reclamation program must contain a contiguous land unit which constitutes the following minimum fraction of the total parcel.

Parcel Size (Acres)	Minimum Program
20 or Less	Total Parcel
21-100 Acres	1/2 of Parcel but not less than 20 acres
101-200 Acres	1/3 of Parcel but not less than 50 acres
201-400 Acres	1/4 of Parcel but not less than 68 acres
401 or More	1/5 of Parcel but not less than 100 acres

(2) The Bureau may make exceptions to these minimums upon justification by the landowner and a finding by the Bureau that due to unique circumstances, a substantial regional benefit would result from the reclamation proposed.
Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.038 FS. History--New 3-24-82, Amended 1-10-85, Formerly 16C-17.06, 16C-17.006.

62C-17.007 Duration of Reclamation Programs.

(1) The Department recognizes that geographic extent, diversity of existing and proposed landforms and availability of fill and revegetation materials have a direct bearing on the time required for the completion of a reclamation program. Landowners are encouraged to complete reclamation programs in the most timely manner consistent with good quality work.

(2) Each reclamation program shall include a timetable for completion of each stage of the program.

(3) The following time periods are the maximum allowed durations for those programs not using sand tailings fill:

Acres In Program	Earth Moving Stage	Revegetation Stage	Establishment Stage	Total Program
20 or less	6 months	1 year	1 year	30 mos.
21-100	1 year	1 year	1 year	3 years
101-200	2 years	1 year	1 year	4 years
201-400	3 years	1 year	1 year	5 years
401 or more	4 years	1 year	1 year	6 years

On parcels of four hundred (400) or more acres, the owner should give serious consideration to multiple programs within the parcel.

(4) Programs proposing to use sand tailings for fill material may have the maximum time period for the earthmoving stage extended by up to fifty percent (50%).

(5) Programs on clay settling areas required to submit applications, pursuant to Rule 62C-17.009(5), may have the maximum time period for the earthmoving stage extended by up to five (5) years.

(6) Programs on clay settling areas may have the initiation of the earthmoving stage begin prior to the certification of abandonment of the dams by the Florida Department of Environmental Protection.

(7)(a) The Bureau may approve the extension of any stage for good cause. The Landowner shall provide a detailed explanation of the good cause in any request for extension of any stage.

(b) Any approved extension of the duration of a stage of a reclamation program shall extend the duration of the total program by the amount of the extension of duration of the particular stage.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.038 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.07, 16C-17.007.

62C-17.008 Reclamation Standards and Criteria.

(1) Safety.

(a) Site cleanup. Each program site shall be left in a neat, orderly condition by removing or adequately burying all debris, junk, abandoned equipment, abandoned structures or parts of structures, worn-out or unusable equipment or materials, as well as all footings, piles, pilings, and cables.

(b) Any existing structures, roads, pilings, or other artifacts on a program site which the Landowner anticipates retaining after reclamation shall be identified in the program application together with their proposed use.

(c) Should a Landowner demonstrate that slope requirements of this rule cannot be met, the Landowner shall identify any locations where a potential hazard exists or may exist and shall provide, in the program application, for the construction of a protective fence.

(2) Contouring. The proposed landforms after reclamation shall be those best suited to enhance the recovery of the land into natural appearing areas. Any identified use to be made of the area shall not conflict with the Local Comprehensive Plan or the Comprehensive Regional Policy Plan, adopted pursuant to Chapter 186, F. S.

(a) Upland slopes of any reclaimed land areas shall normally be no steeper than four (4) feet horizontal to one (1) foot vertical to provide for the safety of the general public. When reclaiming above-grade clay settling areas, Landowners are encouraged

to incorporate a variety of slopes four (4) feet to one (1) foot or flatter to result in a rolling topography. For long continuous slopes, mulching, contouring, vegetation, or other suitable techniques shall be used to enhance stabilization. Should washes or rills develop after revegetation to such an extent that an erosion problem would result, the Landowner shall repair the eroded area prior to the program's final certification of completion.

(b) Deviations from upland slopes of no steeper than four (4) feet horizontal to one (1) foot vertical shall be approved by the Bureau in those instances where:

1. The ownership boundary of the program site is such that this standard could be met only by excessive excavations resulting in undesirable water body depths or where excessive volumes of fill material would have to be imported to the site; or

2. There currently exist mature patches of desirable vegetation or desirable trees which could be expected to survive the reclamation activities and would contribute significantly to the recovery of the site.

(c) Any reclamation program in which a deviation from the slope requirements of this rule is necessary shall contain the request for a deviation, together with detailed dimensions of the requested deviation in the application for a reclamation program, as well as the reasons for the requested deviation. The use of sloping terraces is encouraged if a deviation from the slope requirement is necessary. The steeper terrace faces shall be separated from adjacent terrace faces as far as possible but at least ten (10) feet horizontally. Terrace faces shall extend over no more than four (4) feet vertically on any single terrace.

(d) The design of artificially created wetlands and waterbodies shall be consistent with health and safety; maximize beneficial contributions within local drainage patterns; provide aquatic and wetland wildlife habitat values; maintain water quality, both within the waterbody and downstream by preventing erosion and providing nutrient uptake; and does not conflict with the Local Comprehensive Plan or the Comprehensive Regional Policy Plan adopted pursuant to Chapter 186, F.S.; enhance the potential for productive human use of the adjacent uplands. Waterbodies should incorporate emergent habitat, both deep and shallow water, naturally fluctuating water levels, high ratios of shoreline length to surface area, and a variety of shoreline slopes. Variety in configuration of both plan view and profile of waterbodies is encouraged within the reasonable limits of insuring that peninsulas and bays will be beneficial and useable features. The configuration known as "finger" lake(s) shall be approved where the submerged slopes are no steeper than four (4) feet horizontal to one (1) foot vertical from the design average water level out to six (6) feet of water depth.

(e) Waterbodies shall be constructed with submerged slopes no steeper than four (4) feet horizontal to one (1) foot vertical from the design average water level out to six (6) feet of water depth. Where practical, waterbodies constructed in parcels lying generally three (3) miles or more outside the corporate limits of municipalities should be constructed with approximately twenty percent (20%) of the design low water

surface area less than six (6) feet deep at design low water. Waterbodies constructed in parcels lying generally three (3) miles or more outside the corporate limits of a municipality and in excess of ten (10) acres and not constructed with twenty percent (20%) less than six (6) feet deep shall be constructed with a minimum of one-half (1/2) of the lineal feet of shoreline having submerged slopes no steeper than six (6) feet horizontal to one (1) foot vertical from one (1) foot above the design average water level out to six (6) feet of water depth. Those parcels lying generally three (3) miles outside the corporate limits of municipalities are more specifically identified by parcel number in the files of the Bureau.

(f) The Department shall approve deviations from (d) and (e) above when:

1. The ownership boundary and the existing landform to be reclaimed (amount of earth material above the water table compared to the extent of submerged void) preclude the meeting of the slopes required;

2. The proposed use of the reclaimed site is for construction of buildings and their attendant facilities and such proposed use is not in conflict with the Local Comprehensive Plan or the Comprehensive Regional Policy Plan, adopted pursuant to Chapter 186, F.S.; or

3. The reclamation program is within an urban area defined by the affected local governing body through its Local Comprehensive Plan enacted in conformance with the Local Government Comprehensive Planning Act of 1975 (Chapter 163, F. S.).

4. Deviations in 2. and 3. above shall not result in submerged slopes steeper than four (4) feet horizontal to one (1) foot vertical from shore out to six (6) feet of water depth.

(3) Revegetation.

(a) Although the hydroperiod and soil type of lands to be reclaimed have been altered to the extent that the reestablishment of the historical order of plant succession may not be practical, it is the objective of these guidelines for revegetation to establish a diverse, productive, and natural appearing plant community within the limits of the land capability and various plant tolerances.

(b) The Landowner will develop a schedule for the proposed revegetation including species of trees, grasses and any shrubs to be planted; location and spacing of vegetation; and where necessary, a program for treating the soils to prepare them for planting. Furthermore, the Landowner shall provide a flexible planting schedule to insure an adjustment to the revegetation timetable when weather conditions or seasonal changes in the weather would be detrimental to the survival of the revegetation.

(c) A program site must have established ground cover on a minimum of eighty percent (80%) of the upland area excluding roads, groves, or row crops at the end of the establishment stage. Bare areas shall not exceed one-quarter (1/4) acre.

(d) All species used in revegetation shall be indigenous to the State except for upland grasses, and temporary ground cover vegetation.

(e) Each program site containing nonsubmerged land, excluding the greenbelt, shall have a minimum of three (3) different species of indigenous trees planted within its boundaries in sufficient and approximate equal numbers to provide an average minimum density of twenty (20) healthy trees per acre of nonsubmerged land at the end of the establishment stage. It is assumed that planted trees (bare-root seedlings) will experience a fifty percent (50%) mortality during the establishment stage. The trees may be concentrated onto no less than ten percent (10%) of the total nonsubmerged area, provided that the planting includes upland and transition zones (if any), and that no single area of the planting of trees -- patch, greenbelt or windrow -- be smaller than one-quarter (1/4) acre, and further, that no area without trees be greater than forty (40) acres.

(f) All submerged land features within the program site shall have a greenbelt of trees along a minimum of fifty percent (50%) of the perimeter of the feature. The greenbelt shall extend at least thirty-five (35) feet, but not to exceed one hundred ten (110) feet, upland from the highwater line of the feature. The greenbelt shall consist of a minimum of three (3) different species of trees. Both upland and water tolerant species shall be included. Survival density shall be two hundred (200) trees per acre. It is assumed that planted trees (bare-root seedlings) will experience a fifty percent (50%) mortality during the establishment period.

(g) Herbaceous wetland areas within the program site shall be revegetated with a minimum of five (5) indigenous species of wetland plants planted in approximately equal numbers, excluding cattails, primrose willow, and exotics. These plantings shall be spaced on three-foot (3-foot) centers, and demonstrate fifty percent (50%) survival at the end of the growing season. Any acreage of cattails and/or primrose willows existing in an herbaceous wetland shall not exceed twenty percent (20%) of the total wetland acreage. Areas to be reclaimed as wooded wetlands shall be planted with a minimum of three (3) different species of indigenous trees in sufficient and approximately equal numbers to provide an average density of two hundred (200) healthy trees per acre at the end of the growing season. It is assumed that planted trees (bare-root seedlings) will experience a fifty percent (50%) mortality during the establishment period.

(h) A program site planted with trees on which livestock grazing will be allowed shall have the trees protected from the livestock by a fence of such construction as to reasonably protect the plantings for five (5) years.

(i) Programs designed wholly or in part as wildlife habitats must incorporate greenbelts on swales. The greenbelt should provide at least a thirty-five-foot (35-foot) wide wildlife corridor on each side of the swale. All submerged features, including herbaceous and/or wooded wetlands, shall have a greenbelt according to (f) above. Wildlife habitats must utilize the upland forest requirements to maximize the habitat quality by planting upland forests adjacent to the greenbelt area or the submerged feature and thus utilize the edge effect of continuous cover from one type of vegetative

cover to another type of vegetative cover. The Bureau shall waive the forty-acre (40-acre) forestation requirement of paragraph 62C-17.008(3)(e) to permit the maximum utilization of upland forested areas to enhance the wildlife habitat. Where practical, wildlife habitats established on a program should be connected to any similar wildlife habitats on adjacent programs. Landowners electing to establish a wildlife habitat shall receive an enhanced priority recommendation after review of the reclamation application.

(j) For programs where wildlife habitat is all or a significant portion of the proposed use of the program site, the Landowner shall consult with the Florida Game and Fresh Water Fish Commission and provide the results of this consultation to the Bureau as a part of the Landowner's application. Slopes, revegetation, reforestation and erosion control requirements may be waived or modified by the Bureau in areas where such changes will benefit the overall plan for wildlife habitat restoration.

(4) Water quality.

(a) All waters of the State on or leaving the program site shall meet applicable water quality standards of the Florida Department of Environmental Protection, Chapter 62-3, F. A. C.

(b) Water within all wetlands and waterbodies shall be of sufficient quality to allow recreation or support fish and other wildlife.

(5) Drainage. To the extent feasible, the Landowner shall restore certain drainages as a desirable step toward the re-establishment of regional drainage patterns. These drainages are included, but are not limited to those highlighted in the Report.

(6) Deviations. Any deviations from standards and criteria which would minimize expenditures in excess of maximum reimbursable cost as provided for in Section 62C-17.010, may be approved provided there is no significant impact on environmental quality.

(7) Additional work effort. Landowners proposing immediate use of a program site for such uses as silviculture, livestock grazing, agriculture crops, or development shall review subsection 62C-17.009(11).

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.038 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.08, Amended 12-25-86, 6-13-91, Formerly 16C-17.008.

62C-17.0085 Acquisition Standards and Criteria.

(1) Acquisition applications for nonmandatory lands shall be considered with the reclamation applications for funding under the provisions of subsection 62C-17.005(3). The per acre cost of lands acquired under this program are subject to the limitations of Chapter 253, F.S., and shall not exceed the maximum allowable per acre cost established for reclamation in subsection 62C-17.010(3) unless the Department specifically determines that a payment in excess of this per acre cost is necessary and

appropriate to effect the purposes of Chapter 378, Part I, F.S., and that such payment will not adversely affect the ability of the Department to reimburse Landowners for reclamation of eligible parcels in accordance with Chapter 378, Part I, F.S., and this Chapter 62C-17, Florida Administrative Code. Acquisition applications received by January 1 of each year shall be considered with the reclamation applications which are received by July 1 of that year.

(2) Acquisition applications may be filed by any interested person or the Bureau, and must identify a managing agency responsible for the management of the property after acquisition, and shall meet one or more of the following standards and criteria:

(a) Lands which have been or may be naturally reclaimed and which are suitable for hunting, fishing, or other outdoor recreational purposes;

(b) Lands which have been or may be naturally reclaimed and which provide valuable wildlife habitat;

(c) Lands which will serve the public interest because of the exceptional need to accomplish the particular reclamation and the Landowner is unable or unwilling to restore or reclaim the land in accordance with the master reclamation plan. Lands in this category shall consist of the following:

1. Lands which are needed for the reestablishment of a stream or river;

2. Lands which are necessary for the reestablishment of regional drainage;

3. Lands which may serve as wildlife or recreational corridors; and

4. Lands which the state may wish to acquire for the preservation of an existing landform.

(3) Costs incurred during the preparation of an application for acquisition by the state are reimbursable. The applicant may apply for reimbursement of costs necessary to file the application, such as surveys, aerial photographs, appraisals, and application preparation. Any costs which are paid for by the Division of State Lands are not reimbursable to the applicant. Applicant's reasonable and necessary eligible costs are reimbursable after the parcel is approved by the Department for acquisition within the funds available.

(4) Acquisition program applications which are approved by the Governor and Cabinet members and which qualify for funding under the provisions of Section 378.034, shall be transferred upon approval to the Division of State Lands for acquisition according to Chapter 253, F.S.

Specific Authority 378.021, 378.034, 378.036, 378.038, 370.021 FS. Law Implemented 378.036 FS. History--New 1-10-85, Amended 12-3-85, Formerly 16C-17.085, Amended 12-25-86, 6-13-91, Formerly 16C-17.0085.

62C-17.009 Applications.

The Department acknowledges that a significant number of Landowners have received approval of reclamation plans. The approval of reclamation plans, which are strictly conceptual in nature and not a precondition to reclamation program approval,

does not offer any additional priority to reclamation program applications filed subsequent to these approved plans. In order to evaluate the extent of reclamation proposed, and the landforms proposed to result from the reclamation as early as possible; to evaluate acquisition proposals; to establish eligibility; to provide an estimate of reclamation cost; and otherwise assist the Landowner in submitting a reclamation program application prior to consideration by the Committee, applications for participation in the Nonmandatory Land Reclamation Program may be submitted in two stages -- a prereclamation application and a reclamation program application.

(1) A prereclamation application shall be made on forms provided by the Bureau or in a manner which will clearly document the information required on the forms. Form DNR 53-010(16) "Prereclamation Application" is incorporated by reference into this rule with the effective date of November 1985. Copies of the form may be obtained from the Bureau.

(2) Landowners shall include their entire eligible ownership in any prereclamation application. In those instances where a Landowner's prereclamation application encompasses less than a whole parcel and less than the Landowner's ownership within that parcel, the prereclamation application shall identify any other anticipated reclamation program(s) for the remainder of his land in the parcel. In those instances where a Landowner's prereclamation application contains more than one anticipated reclamation program, the Landowner shall identify his preferred priority for submitting the reclamation programs and the preferred year for submittal of each program application.

(3) The estimated cost of reclamation of each proposed reclamation program in each prereclamation application shall be developed by staff using historical cost data from prior approved reclamation programs. This information will be made available to assist the Landowner in submitting a reclamation program application.

(4) The Bureau's review of the prereclamation application is nonbinding in regards to the approval and funding of reclamation programs.

(5) Landowners shall reclaim all nonmandatory lands which were put into use as clay settling areas after July 1, 1975, and on or before July 1, 1984, under the Nonmandatory Land Reclamation Program. Landowners shall submit reclamation program applications within one hundred eighty (180) days after the land ceases to be used as a clay settling area. The requirements of this subsection are expressly contingent upon the availability of sufficient funds in the Nonmandatory Land Reclamation Trust Fund.

(6) Landowners should submit reclamation program applications to the Bureau by July 1 to allow sufficient time to review the application for completeness before November 1. All applications which are complete by November 1 will be evaluated and considered for funding.

(7) Within forty-five (45) days after initial receipt of a reclamation program application, the staff shall review each application and shall request submittal of all

additional information necessary to complete the application. Within thirty (30) days after receipt of such additional information, staff shall review it and may request only that information needed to clarify such additional information or to answer new questions raised by or directly related to such additional information. The Landowner shall be notified when his application is deemed complete or incomplete.

(8) Applications shall be made on forms provided by the Bureau. The Landowner shall submit three (3) copies of the completed application which shall include all the information, certifications, aerial photographs, drawings, and reports certified by an engineer and/or surveyor registered to practice in the State of Florida, as applicable. Each application shall be signed and bear the seal of an engineer registered to practice in the State of Florida, except those applications involving only donation or purchase of nonmandatory lands. Form DNR 53-011(16) "Reclamation Program Application" is incorporated by reference into this rule effective April 1990. Copies of the form may be obtained from the Bureau.

(9) Each reclamation program application shall include a current list of names and mailing addresses of all adjacent Landowners within the parcel or within one hundred (100) feet of the program's boundaries. The staff shall notify each identified adjacent landowner of the application. In those instances where objections to said application are offered by an adjacent Landowner, the Bureau will notify the adjacent Landowner by certified mail of the date that the reclamation program application is to be submitted to the Committee so that the adjacent Landowner may attend the meeting to present objections to the Committee for consideration.

(10) Each application shall include a statement from the appropriate local government(s) that the proposed reclamation is consistent with the Local Comprehensive Plan and the Comprehensive Regional Policy Plan, adopted pursuant to Chapter 186, F.S.

(11) In order to achieve the standards and criteria of Section 62C-17.008, and to facilitate the extra or special earthmoving or vegetation planting required for a specific land use planned by the Landowner which does not conflict with the Local Comprehensive Plan or the Comprehensive Regional Policy Plan adopted pursuant to Chapter 186, F.S., the Bureau shall consider reclamation programs which will result in reclamation of units of eligible land for specific land uses, with additional earthmoving and vegetation plantings occurring during reclamation under the following circumstances:

(a) Reimbursement of the Landowner's cost of reclamation from the Nonmandatory Land Reclamation Trust Fund shall not be more than the maximum reimbursable reclamation cost pursuant to Section 62C-17.010, to achieve the standards and criteria of Section 62C-17.008.

(b) The estimated cost of the reclamation to achieve the standards and criteria of Section 62C-17.008, shall be identified and agreed upon by the Landowner and Bureau prior to approval of the reclamation program. No funds from the Nonmandatory Land

Reclamation Trust Fund shall be granted to reimburse any of the additional work effort.

(c) The application for a reclamation program shall set forth the total effort proposed by the Landowner including estimated cost and identification of the additional work to achieve reclamation for a specific use.

(d) The additional work effort shall be confined to earthmoving, earthen retaining structures, preparation for planting and cultivation of agriculture or silviculture crops, or additional vegetation which for reasons of efficiency and economy can be accomplished simultaneously.

(e) The Landowner shall maintain cost records which clearly set forth and separate the costs of eligible reclamation work for reimbursement and that additional work required for the specific use planned.

(f) The costs of water control structures, required as a condition for approval of a permit from a regulatory agency of the State of Florida or any other agency having jurisdiction over the application site, are reimbursable upon proof by the Landowner that the structure is required. The cost of artificial structures required to convey water from elevated clay surfaces to lower elevations may be reimbursable in those instances where it is necessary to prevent erosion. Structures should be designed to be as naturally appearing as possible. No other permanent structural work nor additional vegetation plantings will be included in the eligible reimbursable cost (examples -- retainer walls, compaction costs, agricultural or silvicultural crops).

(g) Additional work effort performed shall conform to the standards and criteria of Section 62C-17.008.

(h) All work to be performed on the program site shall be included in the reclamation program application.

(i) Inspections, including final inspections, shall evaluate the entire work performed.

(j) In order to provide a means for the Landowner to achieve an agricultural land use involving the planting of agricultural crops and silvicultural crops, the Landowner must request, at the time of application, a waiver of the revegetation and establishment requirements of this rule to permit the immediate agricultural or silvicultural use. Agricultural and silvicultural plantings will be done at the Landowner's expense. Earthmoving costs in excess of minimum standards will be at the Landowner's expense, and must be identified in the application. If the Landowner does not anticipate utilizing the entire program or parcel for the agricultural or silvicultural use then that portion which is not in agricultural or silvicultural use must conform to all standards and criteria based on the acreage not utilized for agricultural or silvicultural use. The request for a waiver of the revegetation and establishment stages does not include pastures as an agricultural use. A Landowner must utilize at least ninety percent (90%) of the program upland acreage for agricultural enhancement. Those reasonable costs for soil amendments, in agricultural or silvicultural applications, are reimbursable when the revegetation and establishment stages are waived. All additional work effort shall be

accomplished within the maximum stage duration limits set forth in these rules. It is the intent of these rules that the extra work effort is in addition to, and not in lieu of, the efforts necessary to meet the standards and criteria of Section 62C-17.008.

(12) In order to assure that the use of fill material from off-site sources will not adversely impact the reclamation of the off-site sources, the owner of the sources of the fill material must certify to the Bureau and the Bureau must be satisfied that the fill material to be used is absolutely surplus to the needs of the off-site source. This certification, when applicable, shall be included in the reclamation program application.

(13) Beginning with the funding for the 1985-86 year, the staff shall, by February 1 of each year, present to the Committee for its consideration the two prioritized lists required by Subsection 62C-17.005(2), of the applications received by the preceding November 1. These lists shall include the staff's recommendation and an estimate of the cost of each reclamation program or land acquisition.

(14) The Committee shall recommend to the Department approval, modification, or denial of reclamation program applications, associated cost estimates, and the staff's recommended prioritized lists. The Committee's recommendations on the prioritization shall be based on the criteria contained in Section 62C-17.005.

(15) The Committee's recommendations shall be submitted to the Department by April 1 for final agency action by June 1 of each year. The Department shall approve, in whole or in part, the list of reclamation program applications in the order of priority in which such reclamation program applications are presented.

(16) Staff shall notify, in writing, the Landowners and appropriate local governmental entities of the Department's final agency action on the list of reclamation program applications. Within thirty (30) days of final agency action, the Bureau shall offer reclamation contracts to each Landowner who received an approval in the order on the priority list to the extent that funds are available for that year. Each applicant shall have thirty (30) days from receipt of the contracts in which to execute the contracts. If the contracts are not executed within the thirty (30) days after receipt, the application shall be removed from the approved list for the current year. Reclamation contracts for additional approved programs may be offered if sufficient funds are available.

(17) Beginning in 1985, reclamation contracts may not be executed and available funds may not be committed after June 30 of the year for which a reclamation program application is approved by the Department.

(18) After receiving the approval of the Department, each reclamation program application for the acquisition of land shall be transferred to the Division of State Lands, which shall acquire the lands in compliance with acquisition procedures of Section 253.025, F.S.

(19) All approved reclamation program applications which are not funded shall be considered by the Committee at its next meeting called for the purpose of approving and prioritizing applications, together with other reclamation program applications

received by November 1 of that calendar year, provided a written request for consideration is received from the Landowner by the Bureau by July 1 of the same calendar year. Supplemental requests by the Bureau for additional information may be made to update the application. Substantial changes in the program may necessitate the submittal of a new application.
Specific Authority 378.021, 378.034, 378.038, 370.021 FS. Law Implemented 378.021, 378.034 FS. History--New 3-24-84, Amended 1-10-85, 12-3-85, Formerly 16C-17.09, Amended 6-13-91, Formerly 16C-17.009.

62C-17.0093 Reclamation Contracts.

(1) Reclamation contracts offered Landowners, execution of which shall signify acceptance of the reclamation program as approved, shall be in duplicate, each of which shall for all purposes be considered an original.

(2) Reclamation contracts shall contain all modifications, if any, to the reclamation program which were not contained in the application or agreed to by the Landowner, in writing, prior to the reclamation program application's approval by the Department. Form DNR-53-012(16) entitled "Reclamation Contract" is incorporated by reference into this rule with the effective date of the rule. Copies of the form may be obtained from the Bureau.

(3) Landowner executed reclamation contracts shall be returned to the Bureau within forty-five (45) days from the receipt of the contracts. The date the Executive Director executes the contracts, on behalf of the Department, shall be the effective date of the reclamation program. The notice to proceed on the reclamation program shall be the return of one of the duplicate contracts.

(4) The amount of reimbursement for reclamation activities allowed in the reclamation contract shall be a grant of money equal to the estimated cost of the reclamation program as approved by the Department. In no event, however, shall the grant amount exceed the maximum amounts specified in Rule 62C-17.010.

(5) Within three (3) months of the effective date of the reclamation contract and prior to any physical alteration of the program area or initiating of any dam abandonment procedures, the Landowner shall notify the Bureau of the date of initiation of reclamation activity. This date of initiation of reclamation shall be the anniversary date of the reclamation program from which the approved stage duration periods will be determined.

(6) Any approved reclamation program for which a reclamation contract has been executed shall be considered abandoned when:

(a) Initiation of reclamation activity does not begin within six (6) months of the effective date of the reclamation contract and the Bureau has not received and approved a written request for an initiation date time extension,

(b) There has been no physical reclamation activity after the initiation of reclamation for a period of one hundred twenty (120) consecutive days, without prior

written approval of the Bureau, or

(c) The Landowner by act, or omission, or otherwise evidences an intent to not complete the reclamation program.

(7) Funds set aside for reimbursement of any reclamation contract which becomes void for the year approved shall become available for other approved reclamation programs prior to June 1 of that year if the Department elects not to complete the reclamation program.

(8)(a) The Bureau shall approve, deny, or approve with modifications time extensions, reclamation program modifications or amendments to the reclamation contract upon written request by the Landowner, provided:

1. The Landowner submits appropriate evidence of the necessity for the time extension, modification or amendment and all documentation requested by the Bureau,

2. The modification constitutes less than twenty percent (20%) of the total work effort under the approved reclamation program, and

3. The modification does not substantially change the original character of the approved reclamation program scheme.

(b) The Department shall approve, deny, or approve with modifications all other reclamation program modifications. Stage duration periods of the reclamation program shall continue to run during the time involved in the time extension, modification or amendment consideration. Should a modification of the reclamation program be approved, the stage duration limits of the amended reclamation program shall be defined with consideration given to the lapsed time involved and the increase/decrease of work effort involved. Should a modification to a reclamation program be approved in which the work previously done pursuant to the original reclamation program be destroyed, the cost of the work destroyed shall not be a reimbursable cost under the reclamation contract.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.035, 378.038 FS. History--New 1-10-85, Amended 12-3-85, Formerly 16C-17.093, 16C-17.0093.

62C-17.0095 Reclamation Contracts Assignment.

(1)(a) Reclamation contracts are not assignable without the approval of the Bureau or the Department. The Bureau may approve the assignment of a reclamation contract if there is not to be any modification to the approved reclamation program. The Department must approve all assignments involving reclamation program modifications.

(b) Where, prior to the issuance of a certification of reclamation completion pursuant to Rule 62C-17.013, and the expiration of any post reclamation conditions stipulated in a reclamation contract, a Landowner wishes to transfer, by sale or otherwise, fee title to lands which have been included in a reclamation contract and where the transferee desires the assignment of the reclamation contract to him, then the transferer or transferee may request that the reclamation contract be assigned.

(c) Should the fee title of lands included in a reclamation contract be transferred, by sale or otherwise, to a new owner without the assignment of the reclamation contract, the Landowner named in the reclamation contract shall retain all obligations to perform under the reclamation contract. If the Landowner fails to perform under the reclamation contract, the Department shall take appropriate legal action to recover cost of damages.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.035, 378.038 FS. History--New 1-10-85, Amended 12-3-85, Formerly 16C-17.095, 16C-17.0095.

62C-17.010 Reclamation Cost.

(1) The Department acknowledges that a number of Landowners have received approval of their reclamation program applications prior to July 1, 1984 and therefore are not subject to the funding limits of Chapter 378, Florida Statutes, as amended July 1, 1984. All actions on reclamation program applications approved by the Department prior to July 1, 1984 shall be governed by the appropriate statutes, rules and regulations in effect at the time of their approval.

(2) In establishing maximum reimbursable reclamation costs, the Department recognizes the existence of multiple landforms within certain parcels. Funding of such programs shall be on a prorata basis for each landform present in the parcel based on the acreage of each landform present. The Landowner shall submit an aerial photograph of the program site clearly indicating the boundaries and acreages of those lands. The outside toe of the dam shall be considered the outside boundary of a clay settling area.

(3) For the 1984-85 year the maximum reimbursable cost per reclaimed acre, based on prereclamation landforms identified in the Report or as determined as part of the Bureau's re-evaluation of the parcel shall be $4,000 for mined-out areas and $2,500 for clay settling areas and other landforms. Commencing with the funding for the 1985-86 year, the maximum reimbursable cost per reclaimed acre for the respective landforms shall be the previous year's maximum reimbursable cost per reclaimed acre adjusted for the percentage change in the Construction Cost Index as published by the Engineering News Record. The percentage change for the 1985-86 year shall be for the interval from July 1, 1984 to December 31, 1984. For the 1986-87 year and thereafter, the percentage change shall be for the twelve (12) month interval from the last month used to establish the prior year's percentage change.

(4)(a) The reimbursement of reclamation costs for a program shall only include actual acres worked. It is recognized that there are instances in which a portion of a program site may not require modification to meet minimum standards. In such cases, the unaffected acreage shall be deleted from the program site acreage when calculating the maximum reimbursable cost of the reclamation program.

(b) In those instances where the Landowner's estimate of cost exceeds the

maximum reimbursable reclamation cost established in this rule, the reclamation program application may be considered by the Committee for recommendation of approval, modification or denial, within the funding limitations of this rule.

(c) In establishing recommended estimated cost of reclamation required by Rule 62C-17.009(14), the staff will recommend the lower of the estimated reclamation cost or the maximum reimbursable reclamation cost.

(5) Those reasonable and properly documented planning, engineering and surveying costs necessary for the preparation of the reclamation program application are reimbursable for those programs under a reclamation contract.

(6) The Department recognizes that time is an important factor in the reclamation of clay settling areas and that the dewatering and crusting phase is the most time consuming phase of the reclamation. In those instances where the landowner desires to initiate the dewatering phase of an eligible, nonmandatory, clay settling parcel or program prior to the submission or approval of an application for reclamation funding, the costs incurred for this activity are reimbursable to the landowner only after approval of a reclamation contract and compliance with the following conditions:

(a) The applicant must file a detailed plan for dewatering and crusting of the clay settling area including the methodology to be used, the estimated timetable to accomplish dewatering and dam abandonment, including breaching, and the estimated cost of the entire phase up to but not including any earthmoving. Form DNR 53-013(16) "Application for Approval of Early Dewatering of Clays" is incorporated by reference into this rule with the effective date of the rule. Copies of the form may be obtained from the Bureau.

(b) The applicant must secure approval, in writing, from the bureau for the plan submitted in (a). No costs will be eligible for reimbursement which have been incurred prior to the bureau's written approval.

(c) The approval of the dewatering phase prior to the approval of a reclamation program application does not guarantee funding, a recommendation for funding, or any enhancement during the prioritization of applications.

(d) Costs which have been approved under an approved dewatering plan may be reimbursed only after approval of the reclamation program application by the Department and issuance of a reclamation contract. These costs shall be considered as part of (5) above for reimbursement purposes.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.034, 378.035, 378.038 FS. History--New 3-24-84, Amended 1-10-85, 12-3-85, Formerly 16C-17.10, Amended 12-25-86, Formerly 16C-17.010.

62C-17.011 Multiple Landowner Application.

A Landowner whose geographic extent of ownership within a parcel will not satisfy the minimum reclamation size necessary for participation in this program and whose land cannot be shown to qualify for an exception to the reclamation program

size requirements of Rule 62C-17.006, is encouraged to join with any adjacent contiguous Landowner(s) in preparing an application for a reclamation program. Such application will require the same information as set forth for a single owner application. In addition to the information set forth in Rule 62C-17.009, the multiple Landowners will be required to designate one of the Landowners as an agent for purposes of contact with the Bureau and to request and receive reimbursements. Also multiple Landowners shall provide a land boundary survey that clearly shows all ownership boundary lines and the program site boundary.
Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.038 FS. History--New 3-24-84, Amended 1-10-85, 12-3-85, Formerly 16C-17.11, 16C-17.011.

62C-17.0115 Nonmandatory Land Reclamation Committee. (REPEALED)
Specific Authority 378.033 FS. Law Implemented 378.033 FS. History--New 1-10-85, Formerly 16C-17.115, 16C-17.0115, Repealed 10-20-96.

62C-17.012 Inspections, Cost Reporting and Auditing.

(1) Inspections.

(a) The Landowner, by executing the reclamation contract, authorizes the employees of the Bureau to enter upon the program site, upon prior notification to the Landowner, during normal business hours to inspect for compliance with the reclamation contract. All staff conducting inspections shall display appropriate identification and comply with all Landowner safety guidelines at all times.

(b) Informal inspections by staff shall occur on an irregular basis at a frequency necessary to ensure compliance with the reclamation contract. All program sites shall be formally inspected at least quarterly. A formal inspection for purposes of reimbursement or certifying completion of reclamation to a particular stage or totally shall be made at the written request of and in the company of the Landowner.

(c) Prior to initiating nonreimbursable activities on the program site as permitted by subsection 62C-17.009(11), the Landowner shall notify the Bureau, in writing, of the anticipated initiation date of the nonreimbursable activities and request a formal inspection to ensure that the reimbursable activities performed prior to the nonreimbursable activities comply with the reclamation contract.

(d) The Landowner's written request for a formal inspection shall include a certification signed and bearing the seal of an engineer registered to practice in the State of Florida, that the completed reclamation is in accordance with the reclamation contract.

(e) Upon receipt of the Landowner's written request for a formal inspection, the staff shall within thirty (30) days conduct an appropriate inspection of the program site. If the inspection reveals that the program site is in compliance with the reclamation contract, staff shall, within thirty (30) days, provide the Landowner an appropriate

certification. Certification of reclamation completion to a particular stage shall constitute final action for that stage and subsequent inspections shall address subsequent reclamation activities and remedial actions such as correction of erosion problems or replanting of vegetation, if such is found necessary. Should the inspection reveal that the program site is not in compliance with the reclamation contract, staff shall, within thirty (30) days, notify the Landowner by certified mail of the noncompliance. The Landowner shall, within thirty (30) days from the date of the certification of the notice, correct the noncompliance. A period longer than thirty (30) days to correct the noncompliance may be granted, in writing, by the Bureau upon the receipt of the Landowner's written request. Once the noncompliance has been corrected, the Landowner shall request, in writing, an inspection to verify that the program site is in compliance. If noncompliance is not corrected within the allotted time, the Bureau shall take the appropriate action to foreclose on the mortgage or to collect the face value of the surety bond or letter of credit required by Chapter 3A-44, Part I, F. A. C., and may recommend to the Department that the Department take charge of the program site pursuant to the reclamation contract and complete the approved reclamation program.

(f) Once the reclamation has been certified complete pursuant to Section 62C-17.013, inspections by staff shall continue, if applicable, on an irregular basis and at least once per calendar year for a period of five (5) years after the date of the certification of reclamation completion to ensure compliance with the five (5) year alteration or agricultural use stipulations of the reclamation contract.

(g) Staff performing inspections shall prepare a written report on each inspection and shall provide a copy of the report to the Landowner.

(2) Cost Reporting.

(a) The Landowner shall provide the Bureau with a certified report of program incurred costs and progress, on forms provided by the Bureau, made during each calendar quarter of a reclamation contract beginning three (3) calendar months after the effective date of the reclamation contract. Each quarterly report shall be due within thirty (30) days following the last day of each quarter. Form DNR 53-001(16) "Quarterly Planned and Expenditure Report" is incorporated by reference into this rule effective November 1985. Copies of the form may be obtained from the Bureau.

(b) For all programs involving the use of the Landowner's employees, equipment, or inventorial materials and supplies to perform approved reclamation activities, the Landowner shall provide the Bureau, prior to submitting the first reimbursement request, detailed information to verify the reimbursable cost for labor, equipment and/or inventorial materials and supplies and to ensure compliance with "Reclamation Work Performed By Landowner" section of Chapter 3A-44, Part I, F. A. C. Information required by the Bureau by way of illustration and not by way of limitation will be:

1. A listing of all job classifications or employee names, with a description of their duties, equipment and inventorial materials and supplies anticipated to be used in

performing the reclamation indicating the per worked hour or item cost;

2. A detailed description of the procedures to be used to accumulate worked hours and quantities of supplies and materials used; and

3. Copies of all forms to be used in accounting for and accumulating worked hours and quantities of supplies and materials used.

(c) Forms for Landowners' cost reporting on reimbursement request are included by reference into this rule effective November 1985. The following forms with titles are included: DNR 53-006(16) "Landowner's Labor and Travel Cost Schedule", DNR 53-007(16) "Landowner's Stock Material Cost Schedule", DNR 53-008(16) "Direct Material Purchases Schedule", and DNR 53-009(16) "Landowner's Equipment Cost". Copies of all forms are available from the Bureau.

(3) Auditing.

(a) Fiscal records shall be maintained in a manner prescribed by Chapter 3A-44, Part I, F. A. C.

(b) Audits will be performed as necessary to ensure compliance with the applicable rules and to certify reclamation cost.

(c) Prior to any audit, staff shall give the Landowner notice of the proposed audit.

(d) Staff performing the audit shall prepare a written report on each audit and shall provide a copy of the report to the Landowner. The Landowner shall respond, in writing, to the findings and recommendations of the report within thirty (30) days of the certification of receipt.

Specific Authority 378.021, 378.035, 370.021 FS. Law Implemented 378.021, 378.035, 378.038 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.12, Amended 6-13-91, Formerly 16C-17.012.

62C-17.013 Reimbursement.

(1) Reimbursement under this Chapter is subject to Chapter 3A-44, Part I, F. A. C.

(2) Landowners shall submit to the Bureau for prior approval all advertisements and bid or proposal documents to be used to solicit bids or proposals for any contractual service or commodity to be used to perform the approved reclamation program.

(3) After staff has notified the Landowner that the program site is in compliance with the reclamation contract for the purpose of reimbursement, the Landowner shall provide the Bureau pursuant to Chapter 3A-44, Part I, F. A. C., the documentation of cost incurred in performing the approved reclamation activities. The documented cost shall be summarized on forms provided by the Bureau. Staff shall, within thirty (30) days, review the documentation of cost submitted by the Landowner and if in order and proper, the Bureau shall authorize the appropriate reimbursement pursuant to the reclamation contract. The following forms are incorporated by reference into the rule

and are effective with the effective date of the rule. Forms DNR 53-013(16) "Reimbursement Request Form, Preparation Instructions"; DNR 53-003(16) "Request for Reimbursement -- Final Completion Method"; DNR 53-003(16) "Statement of Expenditures -- Final Completion Method"; DNR 53-003(16) "Summary of Program Costs -- Final Completion Method"; DNR 53-002(16) "Request for Reimbursement -- Completion of Revegetation Method"; DNR 53-002(16) "Statement of Expenditures -- Completion of Revegetation Method"; DNR 53-002(16) "Summary of Program Costs -- Completion of Revegetation Method"; DNR 53-004(16) "Request for Reimbursement -- Stage Completion Method"; DNR 53-004(16) "Statement of Expenditures -- Stage Completion Method"; DNR 53-004(16) "Summary of Program Costs -- Stage Completion Method"; DNR 53-005 (16) "Request for Reimbursement -- Percentage of Completion Method"; DNR 53-005(16) "Statement of Expenditures -- Percentage of Completion Method"; DNR 53-005(16) "Summary of Program Costs -- Percentage of Completion Method". All forms are available from the Bureau.

(4) When the final inspection of the program site indicates that the reclamation requirements of the reclamation contract have been met satisfactorily, and when the examination of the documentation of the cost of reclamation as reported by the Landowner indicates the costs are in order and proper, the Executive Director is authorized to certify the reclamation completed.

(5) The certification of reclamation completion shall be recorded by the Landowner in the county in which the program site property is located. If the property is located in more than one county, the certification of reclamation contract completion shall be recorded in each county in which the property is located. Proof of recording the certification of reclamation completion must be provided to the Bureau prior to the Bureau's authorization of the final reimbursement.

(6) The Bureau is authorized to take final agency action on all matters required of the Department pursuant to Chapter 3A-44, Part I, F. A. C.

(7) Landowners shall use Bureau provided forms for the documented first mortgages, surety bonds or irrevocable letter of credits required, pursuant to Chapter 3A-44, Part I, F. A. C. Forms DNR 53-014(16) "Nonmandatory Land Reclamation Mortgage", DNR 53-015(16) "Nonmandatory Land Reclamation Surety Bond" and DNR 53-016(16) "Nonmandatory Land Reclamation Irrevocable Letter of Credit" are incorporated by reference into this rule and are effective with the effective date of the rule. These forms are available at the Bureau.

Specific Authority 378.021, 378.038, 370.021 FS. Law Implemented 378.021, 378.034, 378.035, 378.038 FS. History--New 3-24-82, Amended 1-10-85, 12-3-85, Formerly 16C-17.13, 16C-17.013.

CHAPTER 62C-16
MANDATORY PHOSPHATE MINE RECLAMATION

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62C-16.0011 Intent. (REPEALED)
Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.202, 378.204 FS. History--New 10-6-80, Formerly 16C-16.011, Amended 2-22-87, Formerly 16C-16.0011, Repealed 10-20-96.

62C-16.0012 Applicability. (REPEALED)
Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.204 FS. History--New 2-22-87, Formerly 16C-16.0012, Repealed 10-20-96.

62C-16.0021 Definitions.

For the purpose of this chapter, the following words and terms shall have the definitions and meanings ascribed to them in this section:

(1) "Applicant" shall mean the person or agent authorized by the operator to make application to the bureau pursuant to this rule.

(2) "Board" shall mean the Governor and Cabinet sitting as the head of the Department of Environmental Protection.

(3) "Bureau" shall mean the department's Bureau of Mine Reclamation, 903 West Tennessee Street, Tallahassee, FL 32304.

(4) "Conceptual reclamation plan" or "conceptual plan" shall mean a graphic and written description of general activities to be undertaken across the whole mine to comply with the reclamation standards contained in this chapter.

(5) "Department" shall mean the Department of Environmental Protection, 3900 Commonwealth Boulevard, Tallahassee, Florida 32303.

(6) "Executive director" shall mean the chief administrative officer of the department.

(7) "Indigenous species" shall mean species native to the region of Florida in which the reclamation and restoration activities are to be undertaken.

(8) "Mine" shall mean an area of land on which mining operations have been conducted, are being conducted, or are planned to be conducted, as the term is commonly used in the trade. This definition is limited to use as a descriptive term in this chapter and is not intended to define or explain the term as it is used in chapter 211, F. S., nor as it is used or may be used by any other agency.

(9) "Mining operations" shall mean those physical activities other than prospecting and site preparation, which are necessary for extraction, waste disposal, storage, or dam maintenance prior to abandonment.

(10) "New mine" shall mean a mine for which the operator first became obligated to pay a severance tax for the extraction of phosphate rock therefrom after July 1, 1975.

(11) "Operator" shall mean the person engaged, or seeking to be engaged, in the extraction of phosphate rock or any other person who is obligated to reclaim mined lands pursuant to subsection 211.32(1), F. S. For the purposes of section 62C-16.0075,

relating to financial responsibility, "operator" includes a parent, its subsidiary, or division.

(12) "Overburden" shall mean all soil and rock removed to gain access to the phosphate in the process of extraction and shall mean such soil or rock before or after its removal.

(13) "Reclamation" shall mean the reshaping of lands in a manner which meets the reclamation standards, including revegetation, contained in this chapter.

(14) "Reclamation program" or "program" shall mean a detailed graphic and written description of a reclamation plan for a segment of a mine that is consistent with the applicable approved conceptual reclamation plan and that shows with specificity how that segment will be reclaimed to comply with the reclamation standards contained in this chapter. A reclamation program shall include appropriate restoration activities.

(15) "Restoration" shall mean the recontouring and revegetation of lands in a manner, consistent with the criteria and standards established pursuant to this chapter, which will return the type, nature, and function of the ecosystem to the condition in existence immediately prior to mining operations. In requiring restoration of an area, the department shall recognize technological limitations and economic considerations. For example, restoration shall be considered accomplished when immature trees are used; mature trees are not required to be replanted in areas where mature trees were removed to allow for mining.

(16) "Revegetation" shall mean, in reclaimed areas, a cover of vegetation consistent with the standards established pursuant to this chapter and consistent with the land form created and the future land uses. In restored areas, it means a cover of vegetation that is designed to return the restored area to the condition in existence prior to mining.

(17) "Temporary land use" shall mean any use of lands under reclamation or restoration after contouring is complete, but before release, that is necessary for the mining operation or other reclamation or restoration activities within the mine.

(18) "Waste" shall mean all earth materials, exclusive of the phosphate being mined for sale, removed from the acres mined and requiring some means of disposal. This shall only include wastes generated by mining or beneficiation of the phosphate.

(19) "Wetlands" shall mean the various types of habitats and vegetative communities which exist where the water table is at or above grade for periods of the year and shall include forested wetlands, such as hardwood swamps, cypress swamps, and domes, and nonforested wetlands, such as wet prairies and freshwater marshes. Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.203 FS. History--New 10-6-80, Formerly 16C-16.021, Amended 2-22-87, Formerly 16C-16.0021.

62C-16.003 Applications Required.

(1) Approval must be obtained from the department prior to an operator

beginning any reclamation and restoration activities on lands subject to this rule. The following applications are required:

(a) Conceptual plan. Each operator shall have an approved conceptual reclamation plan for each mine under its control. An approved conceptual plan shall be a prerequisite to the approval of reclamation programs.

(b) Conceptual plan modification. Each operator shall have an approved modification for all changes to approved conceptual reclamation plans, whether or not the changes are significant. Time schedule changes that are the result of changes in the rate of mining shall not be considered modifications, but shall be reported in the annual report.

(c) Program. Each operator shall have an approved reclamation program for each site upon which reclamation and restoration activities are to occur.

(d) Amendment. Each operator shall have an approved amendment for all changes to approved reclamation programs, whether or not the changes are significant. A request for a temporary land use after a program has been approved shall be submitted as an amendment. Time schedule changes that are the result of changes in the rate or area of mining or circumstances beyond the reasonable control of the operator shall not be considered amendments, but shall be reported in the annual report.

(e) Variance. Each operator shall have an approved variance for any exception to the provisions of this chapter.

(2) Reclamation activities that are consistent with an approved conceptual plan and the standards in section 62C-16.0051 and have received local government approval may begin prior to approval of a program where such activities are within 500 feet of a public road or mine boundary.

Specific Authority 211.32, 370.021, 378.205, 378.212 FS. Law Implemented 211.32, 378.205 FS. History--New 10-21-75, Amended 10-11-78, 10-6-80, Formerly 16C-16.03, Amended 2-22-87, Formerly 16C-16.003.

62C-16.0032 Application Filing Procedures.

(1) Preapplication Meetings. In order to reduce the time required for processing applications, preapplication meetings are encouraged and should be arranged in accordance with the following:

(a) Prior to submitting an application to the bureau, the applicant should notify the bureau in writing that an application is due to be submitted. The notice should state the purpose of the application and whether or not a preapplication meeting is desired and include a map that outlines the application area.

(b) If a meeting is requested by the applicant, the bureau shall meet with the applicant at the earliest practical time or as otherwise agreed to by both parties.

(c) These meetings are for the purpose of exchanging ideas and information and shall be nonbinding on either party.

(2) Filing. Applications shall be filed with the bureau in accordance with the following deadlines:

(a) Conceptual plans. Conceptual plan applications shall be filed at least six months prior to beginning mining operations. If the operator is required to prepare an Application for Development Approval (ADA) under chapter 380, F. S., the operator shall file the conceptual plan application within seven days of the submittal of the ADA.

(b) Conceptual plan modifications. Modification applications shall be filed at least 90 days prior to beginning activities that constitute a significant change in an approved conceptual plan. If the proposed modification would constitute a substantial deviation to the approved Development Order under chapter 380, F. S., then the modification application and substantial deviation application should be filed within seven days of each other. If a modification application is for activities that are not a significant change in an approved conceptual plan, then the application shall be filed at least 30 days prior to beginning such activities.

(c) Programs. Program applications shall be filed at least six months, but no more than two years, prior to the anticipated initiation of mining in the application area.

(d) Amendments. Amendment applications shall be filed at least 90 days prior to beginning activities which require an amendment to an approved program. However, if an amendment application is for activities that are not a significant change to an approved program, then the application shall be filed at least 30 days prior to beginning such activities.

(e) Variances. Variance applications may be filed at any time.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 10-6-80, Amended 7-19-81, Formerly 16C-16.032, Amended 2-22-87, Formerly 16C-16.0032.

62C-16.0033 Application Review Procedures.

(1) General Processing Procedures.

(a) All applications shall be processed in accordance with the provisions of chapter 120, F. S.

(b) No information regarding any application will be deemed to have been received by the department unless it has been filed with the bureau.

(c) Within 30 days after the receipt of an application, the department shall examine the application, notify the applicant of any apparent errors or omissions, and request any information the department is permitted by law to require. As part of its request, the bureau may require the applicant to provide one document which has been revised to incorporate all submitted corrections and additional information.

(d) If the reclamation activities for which the applicant seeks approval are exempt from the requirements of this chapter, the department shall notify the applicant of its findings within 10 days after receipt of the original application or the timely requested additional information or correction of errors or omissions.

(e) Within 45 days after receipt of any request for additional information or correction of apparent errors or omissions, the applicant shall:

1. Provide the requested additional information or correction of errors or omissions; or

2. Identify any items in the request which the applicant believes are not authorized by law or rule and provide all of the requested additional information or corrections that the applicant is willing to provide; or

3. Request an extension to the 45-day period. The request shall include the date by which the information can be provided and the reason for the extension. The executive director or his designee shall approve reasonable requests that are based on a need to complete data collection.

(f) If the applicant fails to respond, as required in paragraph (e) above, to any request for additional information or correction of apparent errors or omissions, the department shall proceed to process the application after notifying the applicant of its intent to do so and specifying the date on which processing will resume. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the application unless the department timely notified the applicant within the initial 30-day period.

(g) Within 30 days after receipt of any requested additional information or corrections, the department shall examine such information or corrections and shall notify the applicant of any apparent errors or omissions in or additional information needed to clarify or to answer new questions raised by or directly related to the newly submitted material.

(h) An application shall be approved, approved with conditions, or denied within 90 days after:

1. Receipt of the original application; or

2. Receipt of the timely requested additional information or corrections or identification of items believed to be unauthorized by law or rule, if received before the department's notification pursuant to paragraph (f) above; or

3. Receipt of the timely requested additional information or corrections or identification of items believed to be unauthorized by law or rule, if received after the 45-day period and an extension has been granted; or

4. The date specified by the department that processing will resume pursuant to paragraph (f) above; whichever is latest.

(i) The applicant may grant at any time a specific time period for which the 90-day period for department action may be tolled. The grant shall be in writing and shall state the reason and length of time the 90-day period may be tolled. Such grant shall not act to preclude the department from taking action at any time after the 90-day period has begun.

(2) Revisions.

(a) If the department receives an unsolicited revision to an application before

department action on the application, the revision may be considered as part of the application, provided that:

1. The revision does not require additional information or corrections to be submitted, and

2. The department has enough time to review the revision and meet normal internal processing deadlines.

(b) The bureau shall notify the applicant within 30 days after receipt of a revision whether or not that revision will be considered as part of the application, unless that revision is received less than 30 days prior to the date the department intends to take action. If a revision is received less than 30 days prior to the date the department intends to take action, the department shall notify the applicant as soon as practical whether or not the revision will be or was considered.

(c) If the department notifies the applicant that a revision cannot be considered, the applicant may withdraw and refile the original application to incorporate the revision.

(3) Withdrawals. An applicant may withdraw an application at any time prior to the department's action, provided that notice of withdrawal is submitted in writing to the bureau. A new application shall be filed within 30 days of receipt of the bureau's notice that a new application is required, unless a later date is approved by the bureau. The bureau shall approve any reasonable later date that is based on the applicant's need to redesign any or all of the reclamation program.

(4) Comments from Other Agencies. The bureau may seek comments from other appropriate agencies; however, the bureau's consideration of comments on applications shall be limited to matters within the jurisdiction of the commenting agency.

(5) Authority to Approve Applications. Applications shall be approved, approved with conditions, or denied, as follows:

(a) The board shall take final agency action on applications for:

1. Conceptual plans.

2. Modifications to conceptual plans that result in significant changes to an approved conceptual plan.

3. Variances.

4. Programs excepted from paragraphs (c) and (d) below.

(b) Approval of a conceptual plan, conceptual plan modification, or variance shall not constitute the approval of a program.

(c) The executive director shall take final agency action on applications for modifications to approved conceptual plans, except those that will result in significant changes or will require a variance. Approval of a conceptual plan modification shall not constitute the approval of a program.

(d) The executive director shall take final agency action on applications for programs and program amendments, except for those which contain significant changes to an approved conceptual plan or would require a variance.

(e) Approval of a conceptual plan or program does not constitute a statement or admission by the department concerning the ownership of any interests in lands included in a conceptual plan or program.
Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205, 378.206 FS. History--New 2-22-87, Formerly 16C-16.0033.

62C-16.0034 Notice to Parties and Interested Persons. (REPEALED)
Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 2-22-87, Formerly 16C-16.0034, Repealed 10-20-96.

62C-16.0035 Previous Approvals and Inconsistencies. (REPEALED)
Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 2-22-87, Formerly 16C-16.0035, Repealed 9-25-96.

62C-16.0036 Application Standards.

All applications shall be submitted using forms incorporated by reference in section 62C-16.0095 and shall meet the following minimum standards:

(1) At least one copy of signed documents made a part of the application shall bear an original signature.

(2) All maps, cross sections, and drawings shall be originals or legible 1:1 reproductions, and shall be no larger than 30 inches by 40 inches, including a one-inch border.

(3) All maps, cross sections, and drawings shall include at least the following information:

(a) Legend for all symbols and patterns.

(b) Title which explains the purpose of the graphic.

(c) The date the original was prepared.

(d) If revised, the date the revision was prepared.

(4) All maps shall include at least the following additional information:

(a) Sections, townships, ranges, and counties.

(b) Section corners. At least three corners from the same section shall be included.

(c) North arrow.

(d) Scale bar.

(5) All cross sections shall include at least the following additional information:

(a) Horizontal and vertical scales.

(b) Clearly defined and labeled endpoints.

(c) Geographic location on a map.

(6) The original scale for all conceptual plan maps shall be one inch equals 2,000 feet, or 1:24,000.

(7) The original scale for program maps shall be no smaller than one inch equals

500 feet, unless the program area will not fit within the format requirements of subsection (2) above.

(8) All drawings shall include scales, if such drawings are scaled drawings.

(9) Each application shall include aerial photographic coverage of the application area. The photographs shall include the date flown, approximate scale, and section corners.

(10) an applicant may submit to the bureau as part of an application any documents, graphics, or other materials which have been prepared as part of other regulatory or planning programs, including chapter 380, F. S., provided the format and information given in these materials meet the requirements of this chapter and the original document is properly referenced.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 2-22-87, Formerly 16C-16.0036.

62C-16.0041 Conceptual Plans and Modifications.

Each conceptual plan application and conceptual plan modification application shall describe in writing and graphically, as required by the bureau, the activities which are the subject of the application.

(1) Conceptual Plan. A conceptual plan application shall:

(a) Describe the location, areal extent, and ownership of the mine.

(b) Classify all lands within the mine as mined before July 1, 1975, disturbed before July 1, 1975, mined or to be mined after June 30, 1975, disturbed or to be disturbed after June 30, 1975, or to remain undisturbed by mining operations.

(c) Describe the status of all lands mined or disturbed by mining operations before July 1, 1975.

(d) Describe the geology, topography, drainage, vegetation, and land uses within the mine prior to mining operations.

(e) Describe, as existing immediately prior to mining operations and site preparation, the presence and habitat location of plant and animal species listed as threatened or endangered by the Florida Game and Fresh Water Fish Commission or the U. S. Fish and Wildlife Service.

(f) Describe the mining, waste disposal, and reclamation and restoration plans.

(g) Describe the quantities, by weight and volume, of earth materials to be considered in planning the reclamation and restoration activities.

(h) Describe postreclamation and restoration stratigraphy, topography, drainage, vegetation, and land uses.

(i) Describe permits required for mining or reclamation and restoration activities.

(j) Describe how the natural resources will be preserved and conserved, as specified in section 62C-16.0053 in areas to remain undisturbed.

(k) Provide approximate completion dates, based on mine-years, for mining, waste disposal, and reclamation and restoration activities.

(2) Conceptual plan modification. A conceptual plan modification shall:

(a) Describe which part or parts of an approved conceptual plan will be modified.

(b) Describe the modification.

(c) Explain why the modification is requested.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 10-6-80, Formerly 16C-16.041, Amended 2-22-87, Formerly 16C-16.0041.

62C-16.0042 Programs and Amendments. (REPEALED)

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 2-22-87, Formerly 16C-16.0042, Repealed 9-25-96.

62C-16.0045 Variances.

(1) All applications for a variance, pursuant to section 378.212, F. S., shall be in accordance with these rules. The department shall review the application within a reasonable period of time and, if the department determines the application to be incomplete, the applicant shall be afforded an opportunity to supply additional information before the department evaluates the merits of the application. The applicant shall address the following factors in the application:

(a) The statute or rule from which a variance is sought.

(b) The facts which show that a variance should be granted because of one of the reasons set forth in paragraphs 378.212(1)(a)--(e), F. S.

(c) The period of time for which the variance is sought, including the reasons and facts in support of the time limit.

(d) The requirements which can be met by the applicant, including the date or time when the requirements can be met.

(e) The steps or measures the applicant is taking or has taken to meet the requirements of the rule or statute from which the variance is requested.

(f) The social, economic, and environmental impacts on the applicant and residents of the area and the state, if the variance is granted.

(g) The social, economic, and environmental impacts on the applicant and residents of the area and the state, if the variance is denied.

(2) Renewals of variances shall be applied for in the same manner as for the initial variance.

(3) Variances may be issued for the life of the facility, or such shorter period of time as may be appropriate. Variances issued for more than five years shall be reviewed by the board at least every five years to assure that the factors justifying the issuance of the variance have not changed so as to make the variance unnecessary. Any order granting a variance for more than five years shall require the operator to submit, at least once every five years, the information necessary to allow the board to conduct this review.

4) Upon receipt of a complete application or the requested additional information for a variance or renewal of a variance, the executive director will submit his recommendations on the application to the board. Comments from other agencies may be solicited, as appropriate, before submitting the recommendation. All applications for variances or renewals of variances shall be approved, approved with conditions, or denied at the discretion of the board.

(5) The action taken by the board shall be the proposed agency action and notice of the action shall be published by the department in the Florida Administrative Weekly and in a newspaper of general circulation in the area affected. The notice shall contain the following:

(a) Name of the applicant, brief description of the variance requested, and its location.

(b) Location of the application and its availability.

(c) Statement of the proposed action.

(d) Notification of an administrative hearing opportunity and time limitations.

(6) If no request for an administrative hearing is received by the department within 14 days from the date of publication of the notice, the action taken by the board shall be final agency action.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 378.212 FS. History--New 2-22-87, Formerly 16C-16.0045.

62C-16.0051 Reclamation and Restoration Standards.

This section sets forth the minimum criteria and standards which must be addressed in an application for a program to be approved.

(1) Safety.

(a) Site cleanup. All lands reclaimed shall be completed in a neat, clean manner by removing or adequately burying all visible debris, litter, junk, worn-out or unuseable equipment or materials, as well as all footings, poles, pilings, and cables. If any large rocks or boulders exists as a result of mining, these should be left either at the surface where they are distinctly visible or placed in mined-out areas and covered to a minimum depth of four (4) feet.

(b) Structures. All temporary buildings, pipelines, and other man-made structures shall be removed with the exception of those that are of sound construction with potential use compatible with the reclamation goals.

(2) Backfilling and Contouring. The proposed land use after reclamation and the types of landforms shall be those best suited to enhance the recovery of the land into mature sites with high potential for the use desired.

(a) Slopes of any reclaimed land area shall be no steeper than four (4) feet horizontal to one (1) foot vertical to enhance slope stabilization and provide for the safety of the general public. For long continuous slopes, mulching, contouring, or other suitable techniques shall be used to enhance stabilization. Should washes or rills

develop after revegetation and before final release of the area, the operator shall repair the eroded areas and stabilize the slopes to eliminate any further similar erosion.

(b) The operator shall inform the department of the nature and an estimate of the amount of strata planned to be removed during mining operations which is unsuitable for general reclamation use because of its potential hazard to the health and safety of the general public. Material of this type shall be replaced in the mine cut beneath all other backfill material.

(3) Soil Zone.

(a) The use of good quality topsoils is encouraged, especially in areas of reclamation by natural succession.

(b) Where topsoil is not used, the operator shall use a suitable growing medium for the type vegetative communities planned.

(4) Wetlands which are within the conceptual plan area which are disturbed by mining operations shall be restored at least acre-for-acre and type-for-type.

(5) Wetlands and Water Bodies. The design of artificially created wetlands and water bodies shall be consistent with health and safety practices, maximize beneficial contributions within local drainage patterns, provide aquatic and wetlands wildlife habitat values, and maintain downstream water quality by preventing erosion and providing nutrient uptake. Water bodies should incorporate a variety of emergent habitats, a balance of deep and shallow water, fluctuating water levels, high ratios of shoreline length to surface area and a variety of shoreline slopes.

(a) At least 25% of the highwater surface area of each water body shall consist of an annual zone of water fluctuation to encourage emergent and transition zone vegetation. This area will also qualify as wetlands under the requirements of subsection (4) above if requirements in paragraph 62C-16.0051(9)(d) are met. In the event that sufficient shoreline configurations, slopes, or water level fluctuations cannot be designed to accommodate this requirement, this deficiency shall be met by constructing additional wetlands adjacent to and hydrologically connected to the water body.

(b) At least 20% of the low water surface shall consist of a zone between the annual low water line and six feet below the annual low water line to provide fish bedding areas and submerged vegetation zones.

(c) The operator shall provide either of the following water body perimeter treatments of the high water line:

1. A perimeter greenbelt of vegetation consisting of tree and shrub species indigenous to the area in addition to ground cover. The greenbelt shall be at least 120 feet wide and shall have a slope no steeper than 30 feet horizontal to one foot vertical.

2. A berm of earth around each water body which is of sufficient size to retain at least the first one inch of runoff. The berm shall be set back from the edge of the water body so that it does not interfere with the other requirements of subsection (5).

(6) Water Quality.

(a) All waters of the state on or leaving the property under control of the taxpayer

shall meet applicable water quality standards of the Florida Department of Environmental Protection.

(b) Water within all wetlands and water bodies shall be of sufficient quality to allow recreation or support fish and other wildlife.

(7) Flooding and Drainage.

(a) The operator shall take all reasonable steps necessary to eliminate the risk that there will be flooding on lands not controlled by the operator caused by silting or damming of stream channels, channelization, slumping or debris slides, uncontrolled erosion, or intentional spoiling or diking or other similar actions within the control of the operator.

(b) The operator shall restore the original drainage pattern of the area to the greatest extent possible. Watershed boundaries shall not be crossed in restoring drainage patterns; watersheds shall be restored within their original boundaries. Temporary roads shall be returned at least to grade where their existence interferes with drainage patterns.

(8) Waste Disposal.

(a) Clay Wastes.

1. Disposal areas shall be reclaimed as expeditiously as possible. Experimental methods which speed reclamation and which are consistent with these rules are encouraged.

2. To the greatest extent practical, all waste clays shall be disposed of in a manner that reduces the volume needed for disposal.

3. Above-ground disposal areas shall be reclaimed in a manner so that long-term stabilization of retention dikes and dams is assured.

4. Waste clays shall be disposed of in a manner which minimizes the length of time waste disposal sites are needed for mining operations, reduces the impact on drainage patterns and premining topography, and considers postreclamation land use potential.

(b) Sand Tailings.

1. Sand tailings should not be permanently spoiled above natural grade unless needed to meet regulatory or environmental requirements.

2. The operator shall give highest priority to the use of sand tailings for backfilling mine cuts, for accelerating the thickening of waste clays, or as a soil enhancement by mixing the sand with the surface clays on clay storage areas.

(9) Revegetation. The operator shall develop a revegetation plan to achieve permanent revegetation, which will minimize soil erosion, conceal the effects of surface mining, and recognize the requirements for appropriate habitat for fish and wildlife.

(a) The operator shall develop a plan for the proposed revegetation, including the species of grasses, shrubs, trees, aquatic and wetlands vegetation to be planted, the spacing of vegetation, and, where necessary, the program for treating the soils to prepare them for revegetation.

(b) All upland areas must have established ground cover for one year after planting over 80% of the reclaimed upland area, excluding roads, groves, or row crops. Bare areas shall not exceed one-quarter (1/4) acre.

(c) Upland forested areas shall be established to resemble premining conditions where practical and where consistent with proposed land uses. At a minimum, 10% of the upland area will be revegetated as upland forested areas with a variety of indigenous hardwoods and conifers. Upland forested areas shall be protected from grazing, mowing, or other adverse land uses to allow establishment. An area will be considered to be reforested if a stand density of 200 trees/acre is achieved at the end of one year after planting.

(d) All wetland areas shall be restored and revegetated in accordance with the best available technology.

1. Herbaceous wetlands shall achieve a ground cover of at least 50% at the end of one year after planting and shall be protected from grazing, mowing, or other adverse land uses for three years after planting to allow establishment.

2. Wooded wetlands shall achieve a stand density of 200 trees/acre at the end of one year after planting and shall be protected from grazing, mowing, or other adverse land uses for five years or until such time as the trees are ten feet tall.

(e) All species used in revegetation shall be indigenous species except for agricultural crops, grasses, and temporary ground cover vegetation.

(10) Wildlife.

(a) The operator shall identify what measures have been incorporated into the conceptual plan or program to offset fish and wildlife values lost as a result of mining operations and shall identify special programs to restore, enhance, or reclaim particular habitats, especially for endangered and threatened species, as identified by the Florida Game and Fresh Water Fish Commission or the U. S. Fish and Wildlife Service.

(b) The operator may designate specific locations within the mine as "Wildlife Areas" and include a plan for reclamation and management for sites so designated. Slopes, revegetation, and erosion control requirements may be waived or modified by the department in such areas on a case-by-case basis where such changes will benefit the overall plan for the propagation of wildlife areas.

(11) Time Schedule.

(a) Each operator shall develop a time schedule for completion of the reclamation process in the area covered by the application. The time schedule shall include an estimate of:

1. When removal of phosphate rock in the area will be completed, including the estimated acreage to be mined in each calendar year that mining will occur.

2. When any other mining operations phase in the area will be completed and an explanation of such operations.

3. When waste disposal will be started and completed.

4. When contouring will be started and completed.

5. When revegetation will be started and completed.

(b) Completion dates.

1. Where mined-out areas will be used for waste disposal, waste disposal shall be completed as soon as practical after mining has occurred. Waste disposal on other sites shall also be completed as soon as practical. The completion date for waste disposal shall consider the availability and volume of materials needed.

2. Contouring for all acres mined in a given calendar year shall be completed no later than 18 months after the end of that calendar year or 18 months after an area is capable of being contoured when additional mining operations, such as waste disposal, occur. If contouring is needed on lands that are disturbed by mining operations but not mined, then contouring on such lands shall be completed no later than the end of the year following the year in which mining operations ceased on such lands.

3. Revegetation shall be completed as soon as practical after each acre is contoured, but no later than six months after contouring is required to be completed. The executive director may allow a later completion date upon a showing of good cause.

4. Reclamation and restoration shall be completed within two (2) years of the actual completion of mining operations, exclusive of the required growing season to ensure the growth of vegetation, except that where sand-clay-mix or other innovative technologies are used, the department may specify a later date for completion. The required completion date may vary within a program, depending upon the specific type of mining operation conducted.

5. The completion dates for each phase of the reclamation and restoration activities shall be extended by the period of any delays attributable to causes beyond the reasonable control of the operator.

6. Initiation and completion dates should be specified by month and year only with initiation being the first day of the month and completion being the last day of the month.

7. If the operator designates any mine cut as a future mineable face, the requirements for reclamation on the mineable face and an appropriate buffer zone may be delayed for a maximum period of five years; however, upon a clear demonstration of just cause by the operator, the executive director may extend the five-year delay period. If mining has not resumed along the mineable face within the five-year or approved, longer delay period, the mineable face and buffer zone shall be reclaimed as specified in the approved program. Completion dates for waste disposal, contouring, and revegetation shall be in accordance with 1., 2., and 3. above; however, the completion dates shall be extended by the five-year or approved, longer grace period.

8. The actual completion dates for contouring, revegetation, and the period of establishment shall be based on information provided in the annual reports, as required by section

(12) Exceptions and Innovations. In order to encourage the development of new

technology which will hasten reclamation or improve the quality of restored lands, the board may grant a variance to any of the requirements of section 62C-16.0051 for the following circumstances:

(a) Experimental or innovative techniques where the technology is not proven.

(b) Methods which will increase the overall quality of the reclamation program through the creation of particular landforms or habitats.

Specific Authority 211.32, 370.021, 378.207 FS. Law Implemented 211.32, 378.207 FS. History--New 10-6-80, Amended 7-19-81, Formerly 16C-16.051, Amended 2-22-87, Formerly 16C-16.0051.

62C-16.0053 Remaining Natural Resources. (REPEALED)

Specific Authority 211.32, 370.021, 378.207 FS. Law Implemented 211.32, 378.207 FS. History--New 10-6-80, Formerly 16C-16.053, Amended 2-22-87, Formerly 16C-16.0053, Repealed 10-20-96.

62C-16.0054 Donations of Land. (REPEALED)

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 2-22-87, Formerly 16C-16.0054, Repealed 10-20-96.

62C-16.006 Changes to Approved Conceptual Plans and Programs.

(1) All reclamation and restoration activities shall be carried out as approved; however, when it becomes apparent or is anticipated that a change in an approved conceptual plan or program is needed, the operator shall inform the bureau that a change is needed and obtain approval, as necessary, before proceeding with the change.

(2) The operator shall inform the bureau in writing and with supporting graphics, as needed, of any proposed or anticipated changes in approved conceptual plans or programs.

(3) Within 30 days of receipt of such a notification, pursuant to subsection (1) above, the bureau shall notify the operator whether or not the proposed change is significant or what additional information is needed to make such a determination.

(4) Conceptual Plan Modifications. Changes to approved conceptual plans that are not significant are:

(a) Changes that affect or result in a cumulative change of less than 640 acres or less than 20 percent, whichever is greater, of the originally approved area of the conceptual plan.

(b) Changes that do not alter the method of waste disposal.

(5) Program Amendments. Significant changes to approved programs are changes that affect or result in a cumulative change of more than 100 acres or more than 20 percent, whichever is smaller, of the originally approved area of the program.

(6) All changes in land ownership and operators at a mine shall be reported to

the bureau no later than 30 days after the effective date of such changes.
Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205, 378.206 FS. History--New 10-21-75, Amended 10-6-80, Formerly 16C-16.06, Amended 2-22-87, Formerly 16C-16.006.

62C-16.0067 Inspections.

(1) All authorized representatives of the department, on presentation of appropriate credentials to the operator, or its authorized representative, shall have the right of entry to, on, or through all lands subject to this chapter.

(2) Inspections shall occur on an irregular basis at a frequency necessary to insure compliance with the provisions of these rules. The bureau shall make at least quarterly inspections of all programs and shall make a final inspection for purposes of certifying completion of reclamation and restoration.

(3) Inspections shall occur only during normal office hours, if practical. Inspectors shall give the operator notice of the proposed inspection and shall allow the operator the opportunity to provide appropriate personnel to accompany the inspector while on the operator's premises.

(4) The bureau shall make an initial inspection of each conceptual plan and program area.

(5) Inspections may consist of:

(a) On-the-ground inspections of the affected land.

(b) Taking photographs for official use by the department.

(c) Taking and removing samples of soil, vegetation, water, waste products, or material mined.

(d) Inspection of environmental monitoring installations and data relating to the reclamation and restoration.

(6) A copy of the inspection report will be provided to the operator upon request.

(7) Inspection of premining conditions.

(a) The producer shall provide notice to the bureau at least 30 days prior to initiating a major disturbance. Only one notice shall be required for any given area. Major disturbances shall include:

1. Clearing land in preparation for mining, but not for construction of roads, powerlines, or pipelines.
2. Clearing land for constructing waste disposal sites.
3. Draining wetlands.
4. Removing overburden, if no clearing was necessary.
5. Constructing dams.

(b) The notification shall identify the area to be disturbed by section, township, and range, provide a description of the disturbance, and give the approximate date the disturbance is due to start.

(c) A program application shall be acceptable notice, if filed 30 days prior to

disturbance of the program area.

(8) The bureau shall inspect each approved conceptual plan area at least once every year to verify the status of lands within the mine.

(9) Reclamation program boundaries shall be marked as follows:

(a) As soon as practical after reclamation and restoration activities have begun, the operator shall clearly mark and maintain the boundaries of an approved program area so that they are clearly identifiable until the release of the program. This shall not be construed to require a survey of the program boundary by a registered land surveyor.

(b) No markers shall be required where natural or man-made features, such as roads, railroads, dams, fences, streams, or distinct vegetation clearly delineate the boundary.

(c) Where markers are required, they shall be placed at each corner or inflection in the boundary and at least two markers, the last marker and the next marker, shall be visible from any given marker.

(d) Required markers shall be maintained on each program area through release of the upland portion of that area. Where boundaries divide wetlands, markers may be required through release of the divided wetlands.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 10-6-80, Formerly 16C-16.067, Amended 2-22-87, Formerly 16C-16.0067.

62C-16.0068 Release Procedures.

(1) When the operator fulfills the requirements for a reclamation program, he may request an early release of the program. The request shall be in writing to the bureau on the form incorporated by reference in section 62C-16.0095 and shall include a statement certifying that the requirements of this chapter have been met.

(2) Within 30 days after notification by the operator or the scheduled completion date, whichever comes first, the bureau shall make a final inspection of a program area.

(3) Within 30 days after the final inspection, the bureau shall notify the operator in writing of its findings.

(a) If the bureau is satisfied that the requirements of the program have been met, it shall notify the executive director within 30 days of the final inspection that release is recommended.

(b) If the bureau is not satisfied that the requirements of the program have been met and an early release was requested, within 30 days of the final inspection it shall notify the operator of the deficiencies which must be corrected before release can be recommended.

(c) If the bureau is not satisfied that the requirements of the program have been met and the specified completion date has expired, it shall notify the operator of the deficiencies which must be corrected. Within 60 days after such notice by the bureau,

the operator shall return work on the program to a rate of progress that will reasonably ensure completion within not more than 180 days after receipt of such deficiency notice.

(4) If, following a recommendation for release by the bureau, the executive director is satisfied that all requirements of the reclamation and restoration program have been met, he shall notify the operator in writing within 60 days of the final inspection that the reclamation program is complete and the area is released from further obligation under chapter 211, F. S.

(5) Release of a reclamation program under this chapter shall not operate to relieve the operator of any other obligations imposed under other laws, rules, regulations or ordinances.

(6) If any released area is again disturbed by mining operations, the disturbed areas shall become subject to the requirements of this chapter.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.207 FS. History--New 10-6-80, Formerly 16C-16.068, Amended 2-22-87, Formerly 16C-16.0068.

62C-16.0071 Violations, Damages, and Penalties.

(1) Upon determination by the executive director that an operator is in violation of any requirement of this chapter or approval granted, he shall notify the operator in writing by certified mail of the alleged violation. The notice of violation shall set forth in detail the alleged violation and specify a reasonable time, not to exceed 90 days, in which to begin corrective action. The executive director may also specify a time by which the corrective action must be completed.

(2) If an operator disputes the matters contained in a notice of violation, the operator may request a hearing, pursuant to section 120.57, F. S. If a hearing is requested, the time for initiating corrective action shall not begin to run until a final order is entered.

(3) If the violation specified in the notice of violation has not been corrected upon the expiration of the period provided in the notice of violation, the department may institute a civil action in a court of competent jurisdiction, as follows:

(a) For injunctive or other appropriate relief to enforce compliance with this chapter, or for the assessment of damages, or for both injunctive relief and damages. This paragraph shall not apply to the failure to comply with the requirements of subsection 62C-16.0075(6).

(b) To impose and recover a civil penalty for a violation of this chapter or any order issued pursuant to this chapter. This paragraph shall not apply to the failure to comply with the requirements of subsection 62C-16.0075(6). The penalty shall not exceed the following amounts and the court shall consider evidence in mitigation:

1. For violations of a minor or technical nature, $100 per violation.
2. For major violations on which a penalty has not been imposed under this

subparagraph during the previous five years, $1,000 per violation.

3. For major violations not covered by subparagraph 2. above, $5,000 per violation.

The civil penalties provided for in this paragraph (b) shall not begin to accrue until the expiration of the time for initiating corrective action, as provided in the notice of violation issued by the department. Each day or any portion thereof in which the violation continues shall constitute a separate violation.

(c) To recover against the security provided pursuant to section 62C-16.0075, if an operator has failed to comply with the requirements of subsection 62C-16.0075(6) and the department determines that the operator is unable or unlikely to come into compliance with those requirements within a reasonable time.

(4) Minor violations shall consist of the following:

(a) All violations of a technical nature.

(b) Being behind schedule in contouring or revegetation on reclamation programs more than one, but less than six months, based on the required completion dates in subsection 62C-16.0051(11).

(c) Being out of compliance with contouring and erosion control standards, after the required completion date for contouring in subsection 62C-16.0051(11).

(d) Being out of compliance with revegetation standards, after the required completion date for revegetation in subsection 62C-16.0051(11).

(e) Failure to submit and complete an annual report, pursuant to section 62C-16.0091.

(f) Failure to comply with any rule contained in this chapter, unless otherwise specified in subsections (3) and (4).

(5) Major violations shall consist of any violation not specified in subsection (4) above, including the following:

(a) Undertaking any activities that are not in agreement with the approved conceptual plan.

(b) Undertaking any reclamation or restoration activities that are not approved or in agreement with approved programs.

(c) Being behind in contouring or revegetation on reclamation programs more than six months, based on required completion dates.

(d) Failure to comply with an order issued pursuant to this chapter.

(e) Failure to post a security as required by subsection 62C-16.0075(1).

Specific Authority 211.32, 370.021, 378.205, 378.211 FS. Law Implemented 120.69, 378.211 FS. History--New 10-6-80, Formerly 16C-16.071, Amended 2-22-87, Formerly 16C-16.0071.

62C-16.0075 Financial Responsibility.

(1) Security.

(a) Form of Security. If the Department determines that an operator is not in

compliance with the rate of reclamation established in subsection (5), the department shall notify the operator in writing that the operator shall have 30 days to post one or more of the following forms of security:

1. A lien in favor of the state on unmined lands or on reclaimed and released real property owned in fee simple absolute by the operator.

2. A surety bond using the form provided by the bureau or a comparable format approved by the bureau.

3. A letter of credit using the form provided by the bureau or a comparable format approved by the bureau.

4. A donation of land acceptable to the state whereby every acre donated would relieve the company of the obligation to bond or otherwise provide security for the reclamation of acres mined, based on a ratio of 1 acre donated to cover the financial responsibility for 10 or more, at the discretion of the department, acres of mined lands. This donation would not relieve the operator of the obligation to reclaim and will not be released upon reclamation of the delinquent acres. The donation shall be made in accordance with chapter 253, F. S.

5. A cash deposit or trust fund payable to the state.

(b) The form of security posted shall be at the option of the operator and shall cover the number of acres for which the operator is delinquent in reclaiming in the required time period as well as the number of acres that the operator must reclaim in the current five-year period. The security posted shall remain in effect until all delinquent acres are reclaimed, except as provided in subparagraph (1)(a)4. above.

(c) Release of posted securities. The operator may request that the land upon which a security has been posted be released. Such request shall be in writing to the bureau. If the security cannot be released, the executive director or his designee shall notify the operator in writing within 30 days of such request specifically what work must be done in order to obtain release of the security. The posted security shall be released within 30 days of a determination by the executive director that reclamation upon delinquent acres has been completed. Release shall consist of notification in writing by the executive director that the operator is no longer under obligation to have a posted security and return of the security, except for donated lands.

(d) Failure to provide the department with an acceptable form of security within the time allowed will constitute a major violation for which the department may institute a civil action in accordance with section 62C-16.0071.

(e) The notification provided pursuant to subsection (1)(a), shall include:

1. The number of acres on which reclamation is delinquent.

2. Which five-year period the delinquency covers.

3. The number of acres covered by the current five-year period.

4. The amount of security required at the current time.

5. How the amount of security was determined.

(f) Should the security be in the form of a surety bond, letter of credit or cash

deposit, or trust fund payable to the state, the amount of the security will be adjusted annually for the percentage change in the construction cost index as published in the Engineering News Record. The percentage change shall be for the twelve-month period beginning on the date of notification, pursuant to subsection (1)(a).

(2) Establishment of required security. The amount of the security shall be established by the executive director using the following criteria:

(a) The amount and type of reclamation involved.

(b) The probable cost of proper reclamation.

(c) Inflation rates based on the construction cost index as published in the Engineering News Record.

(d) Changes in mining operations.

(e) The amount of security shall not exceed $4,000 per acre for each reclamation program, adjusted annually by the appropriate inflationary index for construction.

(3) Waiver or Modification of Financial Security. In instances where the intent of the financial responsibility requirements will not be at risk, the department may modify or release an operator from the requirements of posting security. Requests for such modifications or releases shall be filed as requests for a variance in accordance with section 62C-16.0045. Consideration shall be given to the following:

(a) Past performance by the operator in complying with approved reclamation programs and conceptual plans.

(b) Compliance by the operator with all other portions of this rule.

(c) The size and nature of the operation, when the reclamation effort may be reduced significantly by the lapse of time and/or a single reclamation program currently underway would bring the operator into compliance with reclamation rates. It must be shown that reclamation rates would be met should a portion of the reclamation program(s) be considered as reclaimed in proportion to the percentage of the reclamation work effort completed on the program.

(d) The department's analysis of the operator's financial statements.

(4) Financial Statements.

(a) Within 120 days of the end of the operator's annual reporting period, operators shall submit to the department audited financial statements for the mining operation.

(b) Operators that are subsidiaries of a parent may be required to submit audited consolidated financial statements only.

(c) Operators that are parents may be required to submit both separate audited financial statements and consolidated financial statements.

(d) The bureau shall consider the following in the determination of the financial statement's format requirements for segments of a business enterprise:

1. Generally accepted accounting principles.

2. Securities and Exchange Commission (SEC) regulations.

(e) The financial statements must include, at a minimum, a profit or loss statement, balance sheet, statement of changes in financial position, and an audit report. For operators reporting to the SEC, their annual Form 10K shall constitute compliance with this requirement.

(f) All financial statements shall be considered confidential by the department and shall be maintained in locked files of which only authorized personnel shall have access.

(g) The operator shall be responsible for the confidentiality of all financial statements until receipt by the department.

(h) If an operator is not in compliance with the rate of reclamation specified in subsection (6) below, the department may request an explanation of any item of concern on the financial statements, such as, but not limited to, disclaimers or qualifications in the audit report, declining profits, losses, low asset to liability ratio, or rearrangement of debt. This may be followed with a request to interview the auditor of the financial statements, to review the auditor's workpapers, to review the worksheets used to prepare the financial statements, or to review the accounting records of the reporting or current period.

(5) Operators of mines in existence on July 1, 1978, shall have until July 1, 1988, to meet the rate of reclamation in subsection (6) below without incurring the obligation to post any form of security.

(6) For the purpose of section 62C-16.0075, the reclamation shall be accomplished in accordance with the following criteria:

(a) For the period July 1, 1975, to December 31, 1980, for existing mines, or the first five-year period of mining for new mines, no reclamation shall be required and any reclamation which

(b) For the period January 1, 1981, to December 31, 1985, for existing mines, or the second five-year period of mining for new mines, reclamation of acres mined shall be completed at the rate of an acreage equivalent of 15 percent of the acres mined during the period July 1, 1975, to December 31, 1980, or the immediately preceding five-year period, as appropriate. Reclamation in excess of the required percentage shall be credited forward.

(c) For the period January 1, 1986, to December 31, 1990, for existing mines, or the third five-year period of mining for new mines, reclamation of acres mined shall be completed at the rate of an acreage equivalent of 60 percent of the acres mined during the period January 1, 1981, to December 31, 1985, or the immediately preceding five-year period, as appropriate. Reclamation in excess of the required percentage shall be credited forward.

(d) For the period January 1, 1991, to December 31, 1995, for existing mines, or the fourth five-year period of mining for new mines, reclamation of acres mined shall be completed at the rate of an acreage equivalent of 75 percent of the acres mined during the period January 1, 1986, to December 31, 1990, or the immediately preceding

five-year period, as appropriate. Reclamation in excess of the required percentage shall be credited forward.

(e) For the period January 1, 1996, to December 31, 2000, for existing mines, or the fifth five-year period of mining for new mines, and each five-year period thereafter, reclamation of acres mined shall be completed at the rate of an acreage equivalent of 100 percent of the acres mined during the immediately preceding five-year period. Reclamation in excess of the required percentage shall be credited forward.

(f) For the purposes of this subsection, completed shall mean reclaimed through the initial revegetation and not through final release of the reclaimed area.

(g) Acres to be credited forward shall consist of acres mined or disturbed after June 30, 1975, and completed pursuant to paragraph (f) above.

(h) The time periods and reclamation rates specified in this subsection may be modified or waived for experimental reclamation programs to take into account the effect of a temporary shutdown of mining operations or other physical restraints, for unreasonable delays in the processing of reclamation applications by the department, or to relieve or prevent extreme economic hardship on the operator.

(i) The rate of mining during any five-year period is to be determined solely by the operator and not the department.

Specific Authority 370.021, 378.205, 378.208 FS. Law Implemented 378.208, 378.209 FS. History--New 2-22-87, Formerly 16C-16.0075.

62C-16.0091 Annual Reports.

(1) On or before March 1 of each year, each operator shall submit to the bureau a detailed report for the previous calendar year for each mine under its control. The report shall be submitted on the form incorporated by reference in section 62C-16.0095 and shall include:

(a) A written description of all new sites disturbed by mining operations by quarter-quarter section, including township, range, and county. The actual number of acres shall be given for each partial quarter-quarter section.

(b) An accounting of the materials encountered as described in paragraph 62C-16.0051(2)(b) and how they were handled.

(c) A description of reclamation and restoration activities, including the percent completion of each phase, carried out during the year for each approved program and other areas subject to this chapter.

(d) A map which shows all lands disturbed by mining operations within the mine through the previous calendar year, and identified as follows, including acreages for each area:

1. Disturbed by mining operations, but not mined.

a. Prior to July 1, 1975.

b. From July 1 to December 31, 1975.

c. After 1975, specifying the year.

2. Mined.

a. Prior to July 1, 1975.

b. From July 1 to December 31, 1975.

c. After 1975, specifying the year.

(e) A map which shows all programs approved after June 30, 1975, including their current status and acreage, and the location of all permitted water discharge points, including their identification number and the permitting agency.

(f) A map which shows all sites used or under construction for waste disposal, including the type of waste, the acreage of each site, and the beginning and ending dates for disposal.

(g) Any changes in the information required under paragraph 62C-16.0041(1)(k).

(h) Aerial photographs of all disturbed and mined lands, including the area within one mile of such lands within the mine boundary. The photographs shall be taken after December 1, but as close as reasonably possible, to December 31 of the previous calendar year. The copies submitted to the bureau shall be acceptable quality sepias and include the date flown, scale, and locations of section corners.

(2) The bureau shall examine each annual report and notify the operator within 30 days from receipt of the report of any apparent errors or omissions.

(3) The operator shall respond to the bureau's request for corrections of apparent errors or missing information within 60 days.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205 FS. History--New 10-6-80, Formerly 16C-16.091, Amended 2-22-87, Formerly 16C-16.0091.

62C-16.0095 Reclamation Forms.

The following forms are available from the Bureau of Mine Reclamation and are incorporated by reference:

(1) Application for a Conceptual Reclamation Plan, Reclamation Form No. 1, DNR 53-018(16), effective 1/81.

(2) Application for a Reclamation Program, Reclamation Form No. 2, DNR 53-019(16), effective 1/81.

(3) Annual Mining and Reclamation Report, Reclamation Form No. 3, DNR 53-020(16), effective 1/81.

(4) Reclamation Program Early Release Request, Reclamation Form No. 4, DNR 53-021(16), effective 1/87.

(5) Reclamation Modification/Amendment Application, Reclamation Form No. 6, DNR 53-023(16), effective 1/87.

(6) Variance Application, Reclamation Form No. 7, DNR 53-024(16), effective 1/87.

Specific Authority 211.32, 370.021, 378.205 FS. Law Implemented 211.32, 378.205, 378.212 FS. History--New 2-26-81, Formerly 16C-16.095, Amended 2-22-87, Formerly 16C-16.0095.

CHAPTER 62-671
PHOSPHATE MINING WASTE TREATMENT REQUIREMENTS

TABLE OF CONTENTS

62-671.100 Scope/Intent/Purpose. (Repealed)

Specific Authority 403.061, FS.
Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.
History -- New 11-27-89, Formerly 17-671.100, Repealed 12-24-96.

62-671.200 Definitions.

The definitions set forth in Title 40, United States Code of Federal Regulations, Part 401 and Section 436.181, are adopted by reference, except where in conflict with the definitions in this rule. In addition, the definitions in Section 403.031, Florida Statutes, and the following definitions shall apply to this rule:

(1) "Mine" is any area of land, surface or underground, used for or resulting from the extraction of phosphate content from phosphate bearing materials.

(2) A "New Pollution Source" means any mine and beneficiation process for which the construction or operation of the industrial wastewater treatment facilities was not permitted before July 20, 1981. Any mine or beneficiation process for which a complete application to construct the industrial waste treatment facilities was filed with the Department on or before December 31, 1981, shall be deemed as existing. New pollution sources do not include expansions or modifications of existing sources.

(3) "Non-filterable, Non-volatile Residue (Fixed Solids)" means those solids which represent the difference between the total non-filterable residue and the total volatile residue determined in accordance with the test methods specified at page 95 of the 14th edition of Standard Methods for the Examination of Water and Wastewater.

(4) "Normal Working Level" of an impoundment means that level resulting from the normal height or number of damming boards maintained at the outfall(s) under normal operating conditions.

(5) "Points of Discharge" mean any outfall structure or location where the effluent from the mining or beneficiation process leaves the treatment system and enters waters of the State. The point of discharge shall be specified in Department permits for all discharges from a mining or benefication process.

(6) "Sample" means a representative sample of the discharge.

(7) "Total Non-filterable Residue (Total Suspended Solids)" means those solids which are retained by an approved filter and dried to a constant weight at 103° to 105° C as described at page 94 of the 14th edition of Standard Methods for the Examination of Water and Wastewater.

(8) "Total Phosphorus" means the total phosphorus in an unfiltered sample measured in milligrams per liter using the manual or automated ascorbic acid method following persulfate digestion as referenced at pages 476, 481, and 624 of the 14th

edition of Standard Methods for the Examination of Water and Wastewater or measured in accordance with a comparable analytical method approved by the United States EPA or the Department.

(9) The "1-Day Maximum" means the highest values obtained by the methods specified in this rule of total non-volatile, non-filterable residue (fixed solids) and total non-filterable residue (suspended solids) or total phosphorus (P) of any sample collected as defined in (6) during a 24-hour period.

(10) The "30-Day Average" means the flow-weighted arithmetic mean of all the measured pollutant values obtained during any calendar month and analyzed in accordance with this rule. However, if during any calendar month there are three or less measured pollutant values, then the average shall be computed using the most recent four values.

Specific Authority 403.061, FS.
Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.
History -- New 11-27-89, Formerly 17-671.200.

62-671.300 Effluent Limitations.

he effluent guidelines and standards for mineral mining and processing in Rule 62-660.400(1)(e)31., F.A.C., apply herein, except where the provisions of this rule are more specific.

(1) The following effluent limitations apply to effluent discharges by a pollution source after application of the best practicable control technology currently available (BPT) and the best available technology economically achievable (BAT) or which may be discharged by a new pollution source, unless a more stringent standard is specified in accordance with Rule 62-671.310, F.A.C., measured at the point(s) of discharge as specified in a Department permit:

	1 Day Max.	30 Day Avg.
Total non-volatile, non-filterable residue (mg/1)	25	12
Total non-filterable residue (mg/1)	60	30
Total P* mg/1	5	3
pH	6.0 - 9.0	6.0 - 9.0

*Total Phosphorus shall be for monitoring and reporting only, except: if monitoring data shows total phosphorus levels exceed 3 mg/1 monthly average for more than one 30-day period per calendar year, the discharges, upon written notification by the Department, shall prepare and file within 120 days (unless the time is extended by the Department) a study consisting of the following: (a) a chronology of at least one year's

discharge data; (b) an assessment of the cause and origin of the phosphorus constituent of the discharge, (c) description of the discharger's current maintenance, operation and management practices directly related to the control of phosphorus, (d) an evaluation of the environmental significance of the phosphorus levels; and (e) an identity of reasonable methods to abate, to the extent practicable, the influx of phosphorus into the discharge. Upon receipt of the report the Department shall require the applicant to publish a public notice in a newpaper of general circulation in the affected area which states that the report was received and where it is available for public inspection. The Department shall evaluate the report and may amend the discharger's permit to reflect additional requirements (subject to administrative and judicial review), including the implementation of cost-effective management practices or technological advances which reduce or eliminate the phosphorus in the discharge to the maximum extent practicable.

(2) To correct for losses during the testing and analysis, the analytic results from the above specified tests for non-filterable, non-volatile residue (fixed solids) shall be multiplied by a factor of 1.1 to be reported as total non-volatile, non-filterable residue.

(3) Monitoring requirements for effluent limitations shall be, as a minimum, the collection and analysis of one sample per week for each point of discharge when there is a discharge. When there is no discharge, the sample shall be taken the day of the next discharge.

(4) Any overflow caused by precipitation exceeding a 10-year 24-hour precipitation event from facilities designed, constructed, and operated to contain or treat to the applicable limitations the precipitation and runoff resulting from a 10-year 24-hour precipitation event shall not be subject to the effluent limitations of this section. No such overflow shall lower the level of any impoundment below the normal working level of that impoundment or any other impoundment, or below those levels that existed immediately prior to the 10-year 24-hour precipitation event. Provided, however, no source shall be relieved from compliance with Chapter 62-9, F.A.C.

Specific Authority 403.061, FS.

Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.

History -- New 11-27-89, Formerly 17-671.300, Amended 12-24-96.

62-671.310 New Source Requirements.

New pollution sources shall comply with the effluent limitations determined by the Department in accordance with this Rule.

(1) The applicant shall provide the Department with the following information in addition to the information required by Rules 17-3, 62-4, 62-660 and 62-671, F.A.C.:

area concerning the determination required by this paragraph. The notice shall contain, as a minimum, the following information: the name of the applicant, the location of the proposed facility, the proposed receiving water, that an application has been received, the date received, the place where the application can be reviewed, and of the determination required by this paragraph.
Specific Authority 403.061, FS.
Law Implemented 403.021, 403.061, 403.087, 403.088, 403.101, 403.111, 403.121, 403.141, 403.161, 403.182, 403.502, 403.702, FS.
History -- New 11-27-89, Formerly 17-671.310.

Florida Institute of Phosphate Research

FOUNDING LEGISLATION

378.101 Florida Institute of Phosphate Research. --

1. There is created a Florida Institute of Phosphate Research, which is empowered:
   (a) To conduct or cause to be conducted such environmental studies related to radiation and water consumption, or other environmental effects of phosphate mining and reclamation, as may from time to time be deemed reasonably necessary by the institute for the health, safety, and welfare of the citizens of this state and particularly the citizens of the regions where phosphate mining or processing occurs.
   (b) To conduct or cause to be conducted a thorough and comprehensive study of reclamation alternatives and technologies in the phosphate mining or processing industry, including wetlands reclamation.
   (c) To conduct or cause to be conducted a thorough and comprehensive study of phosphatic clay disposal and utilization as a part of phosphate mining, together with all environmental or land use related thereto.
   (d) To establish methods for better and more efficient phosphate recovery mining and processing in this state as it may determine most beneficial to the economy, environment, and way of life of the citizens of the state.
   (e) To enter into any mutually satisfactory contract with any firm, institution, corporation, or federal or state agency, as may be reasonably required or desired in carrying out the research and studies herein authorized.
   (f) To make available to the public the results of its research program so that the research efforts will result in the public's being better informed as to the effects of phosphate mining in the state.
   (g) To hold public hearings and consult with representatives of the phosphate industry and all other interested parties; to assign priorities for its research and studies; to make public from time to time its intentions as to future research and study; and to allocate its resources and personnel for such research and studies as it may determine from time to time to be in the public interest.
   (h) To provide suitable and sufficient laboratory facilities and equipment, making use insofar as practical of the existing laboratory facilities and equipment of the State University System and other facilities as may be available, for carrying out the research and studies herein authorized.
   (i) To administer the Phosphate Research Trust Fund and to expend funds therefrom for its administration and for carrying out the purposes set forth in this section. The Phosphate Research Trust Fund shall be subject to the service charge imposed pursuant to chapter 215.

2. The institute may develop work products relating to research which is subject to trademark, copyright, or patent protection. Notwithstanding any law to the contrary, the institute may:
   (a) Secure patents, copyrights, or trademarks on any of its work products and enforce its rights in such products. It shall consider contributions by Institute personnel, contractors, and grantees in the development of such products and shall enter in to written agreements

with them establishing the interests of the respective parties in each patent, copyright, or trademark it secures.

(b) License, lease, or assign, or otherwise give consent to other persons for the manufacture or use of, work products it develops and receive royalties or other consideration for such use.

(c) Take any action necessary to protect its work products from improper or unlawful use of infringement.

(d) Collect any sums due it for the manufacture or use by any other person of such work products.

(e) Sell its interest in or rights to any work products it owns.

(f) Do all acts necessary to exercise its powers and perform its duties. Any action taken by the institute in securing or exploiting such patents, copyrights, or trademarks shall, within 30 days, be reported in writing to the Department of State. Any proceeds received by the institute under this subsection shall be deposited in the Phosphate Research Trust Fund for use as provided by law.

3. (a) The institute may establish policies necessary to administer its research programs to assure their efficiency and effectiveness, producing the maximum benefit to the economy, environment, and residents of this state.

(b) Materials which relate to methods of manufacture or production, actual or potential trade secrets, patentable or potentially patentable materials, business transactions, or proprietary information pertaining to research conducted by or on behalf of the institute shall be confidential and exempt from the provisions of s. 110.07(1), except that the institute shall disclose upon request, the title and description of any research project, the researchers' names, and the amount and source of funding provided for such project. This exemption is subject to the Open Government Sunset Review Act in accordance with s. 119.14.

4. (a) The work of the Florida Institute of Phosphate Research shall be directed by a five-member board of directors appointed by the Governor. The board shall be composed of one member from the faculty of a university within the State University System, one member from a major conservation group in this state, one member from state government, and two members from the phosphate mining or processing industry. The Governor shall make these appointments on the basis of their ability to set priorities for the phosphate research and otherwise give direction to a professional, efficient, and broad phosphate research effort. In setting such priorities, emphasis shall be given to applied research which tends to solve real problems of the industry in which the public has a substantial interest.

(b) Members of the board of directors shall serve 3-year terms, or serve until successors are appointed; except that, of those members first appointed following October 1, 1983, one member shall be appointed for a term of 1 year; two members shall be appointed for terms of 2 years; and two members shall be appointed for terms of 3 years in order to achieve staggering of terms. A member of the board of directors shall be eligible for reappointment.

(c) A vacancy occurring other than by expiration of a term shall be filled by appropriate appointment for the remainder of the unexpired term in the same manner as the original appointment. However, no single vacancy in the board of directors shall impair the right of the remaining members to exercise the powers of the board of directors.

(d) The members of the board of directors shall select a chairman.

(e) The policies and decisions of the board shall be implemented through an executive director chosen by the board on the basis of professional competence, both scientific and administrative.

(f) The board shall adopt rules necessary to carry out the duties and responsibilities of the

institute.

378.102 Florida Institute of Phosphate Research; procurement of research services.--

1. SHORT TITLE.--This section may be cited as the "Florida Institute of Phosphate Research Competitive Negotiation Act."

2. DEFINITIONS.--As used in this section, the term:
   (a) "Research services" means services within the scope of research, as performed by a chemist, biologist, geologist, engineer, university professor, or other researcher in connection with research performed for the institute.
   (b) "Institute" means the Florida Institute of Phosphate Research.
   (c) "Firm" means any individual, firm, partnership, corporation, association, university, state or federal agency, or other legal entity permitted by law to enter into a contractual agreement for services in this state.
   (d) "Compensation" means the total amount paid by the institute for research services.
   (e) "Project" means the research study or planning activity described by the institute pursuant to paragraph (3)(a)
   (f) "Selection committee" means a group composed of one or more of research directors of the institute and one or more outside experts, knowledgeable in the research subject to be addressed in the project. The committee shall consist of an odd number of at least three members selected by the board of directors of the institute.

3. PUBLIC ADVERTISEMENT AND QUALIFICATION PROCEDURE.--
   (a) The institute shall publicly advertise, in a uniform and consistent manner, each occasion when research services are required to be purchased for a research project or for a research-related planning or study activity and the fee for services exceeds $5,000. The adver- tisement shall include a general description of the project and shall indicate how interested parties may apply for consideration.
   (b) The institute shall adopt administrative procedures for the evaluation of research services, including, but not limited to, qualifications of the firm, capabilities, adequacy of personnel, plan of study, past record and experience, and any other factors applicable to the institute's requirements for a project.
   (c) The proceedings under this section shall be open to the public.

4. COMPETITIVE SELECTION.--
   (a) A selection committee shall be chosen to evaluate current statements of qualifications and performance data on file with the institute, for each proposed project, with statements submitted by other firms regarding the proposed project, and shall conduct dis- cussions with, and may require public presentations by, no fewer than three firms regarding their qualifications, approach to the project, and ability to furnish the required service. If three firms are not available, the board of directors may authorize consideration of fewer than three firms.
   (b) The selection committee, considering the ability of research personnel; past performance; proposed plan of study; willingness to meet time and budget requirements; location; recent, current, and projected workloads; and the volume of work previously awarded to the firm by the institute, shall select in order of preference no fewer than three firms deemed to be most highly qualified to equitably distribute contracts among qualified firms, provided the most

highly qualified firm with the most appropriate plan of study is selected. If fewer than three firms apply, the board of directors may consider the ones that apply.
(c) This subsection does not apply when the fee for professional services is $5,000 or less.

5. COMPETITIVE NEGOTIATION.--
(a) The institute shall negotiate a contract with the selected firm at compensation which is fair, competitive, and reasonable. In making such determination, the institute shall analyze the cost, scope, and complexity of the research services required. Fixed-fee contracts must contain a provision stating that wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time of contracting and must contain a provision that the original contract price and any additions will be adjusted to exclude any significant sums by which the institute determines the contract price was increased due to inaccurate, incomplete, or noncurrent wage rates and other factual unit costs. Contract adjustments must be made within 1 year following completion of a contract.
(b) If the institute is unable to negotiate a fair, competitive, and reasonable contract with the most qualified firm, negotiations with that firm shall be terminated and the institute shall negotiate with the second most qualified firm. If no agreement can be reached with the second most qualified firm, the institute shall terminate negotiations and shall negotiate with the third most qualified firm.
(c) If the institute is unable to negotiate a satisfactory contract with any of the selected firms, the institute shall select additional firms in order of competence and qualifications and shall continue negotiations until an agreement is reached, or the institute may readvertise or terminate the project.

6. PROHIBITION AGAINST CONTINGENT FEES.--
(a) Each contract entered into by the institute for research services must contain the following provision: The researcher warrants that he has not employed or retained any person, other than an employee working only for him to secure this agreement and that he has not paid or agreed to pay any other person any consideration contingent upon the making of this agreement. If this provision is violated, the institute may terminate the agreement without liability and may deduct from the contract price, or otherwise recover, the full amount of such consideration from the researcher.
(b) Any person, other than an employee working only for a researcher, who offers, agrees, or contracts to solicit or secure institute contracts for any person other than the researcher and is to be paid, or is paid, any consideration contingent upon the award of a contract, is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.
(c) Any person who offers to pay or pays any consideration contingent upon the award of any contract is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.
(d) Any person employed by the institute who offers to solicit or solicits a contract for consideration contingent upon the award of such contract is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.

7. APPLICABILITY TO EXISTING CONTRACTS.-- This section does not affect the validity or effect of any contracts in existence on October 1, 1986.

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Chapter 4

A HISTORY OF THE LANSDOWNE SUPERFUND SITE

Sydney Porter, Jr., William Belanger, and John Sykes, III

4.1 INTRODUCTION

With much attention in the field of nuclear decommissioning being focused on nuclear power reactors and the numerous and varied DOE sites, it is easy to lose sight of some equally interesting and problematic non-power reactor restorations. One of these involves the Superfund site in Lansdowne, Pennsylvania. This site has a restoration history that, at this point, is nearly 40 years old and involves a plot and cast of characters worthy of a Sherlock Holmes mystery and a Marx Brothers comedy combined. There are a number of important lessons to be learned from this comedic detective story. Among them is the importance of following the trail beyond the logical end, the need to stick to core competencies, and the value of letting the private sector manage and conduct restoration activities.

Austin Avenue, Lansdowne, Pennsylvania. It was the "tip of an iceberg" in a radium contamination event that led the U.S. Environmental Protection Agency (EPA), Commonwealth of Pennsylvania, the U.S. General Accounting Office, residents of affected properties, and citizens of Lansdowne on an adventure of epic proportions. This is their story.

4.2 AN OVERVIEW OF THE AUSTIN AVENUE RADIATION SITE

4.2.1 The Legacy of Dr. D. Kabakjian

In the early 1960s, headlines were made with the initial decontamination of millicuries of ^{226}Ra throughout the residence of Dr. D. Kabakjian at 105 E. Stratford Avenue, Lansdowne, Pennsylvania. The state of Pennsylvania's Tom Gerusky and the U.S. Food and Drug Administration's (FDA) John Villforth became well-known in the health physics world with their fine and funny presentation of the joint decon effort of the state of Pennsylvania, the FDA, and the U.S. Army.

The initial cleanup, not including manpower, of Dr. Kabakjian's home cost the state of Pennsylvania in excess of $120,000. This cleanup cost greatly exceeded the value of the house at the time, which was about $13,000. The cleanup did not reach the then-current exposure limits for the general public. However, the decision was made at the time that nothing else could be done to clean up the house except to demolish it, and if that were done there would be no way to replace it. The elderly couple living in the house at the time would have lost their life savings, which were tied up in the house. It

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3.8 FURTHER READINGS

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Washington, DC: NRC; NUREG-1507; August 1995.

U.S. Nuclear Regulatory Commission. Staff responses to fre
concerning decommissioning of nuclear power reacto
Washington, DC: NRC; NUREG-1628; April 1998.

was felt that far more damage would be done by demolishing the house t elderly couple were unlikely to contract cancer from future radiation expos their lifetimes.

Starting late in 1984 and continuing through 1987, the EPA re "Lansdowne house" that had been the subject of the earlier cleanup. At th situation had changed somewhat from the 1960s. Instead of an elderly coup mother with children was living in the house. In addition, Superfund now there was an ability to provide replacement housing for residents of Subsequently, the Professor's home was demolished and disposed of as waste. Only two bricks were found to be uncontaminated enough for dispo radioactive waste. The EPA expenditure exceeded $1 million dollars for this "modern guidelines," much of which was devoted to measurement of radio disposal costs. The major lesson learned from this site was that it can be m to dispose of major portions of the house as radioactive than to careful contamination on each piece of rubble.

Further investigation led to the discovery of contamination at the ho his son, a medical doctor. This site was officially named the "Son of Superfund site (located on Lansdowne Avenue near his father's house). Thi discovered because Dr. Kabakjian was making radium sources for medical son was a medical doctor. In this case, adding two plus two equa contaminated house. Dr. Kabakjian Jr. also had a son living in Lansdo house was uncontaminated except for one wooden desk. The desk was rem house was informally dubbed the "Grandson of Lansdowne."

Dr. Kabakjian (the senior) had also been involved in a radiu business prior to his basement business: the W. L. Cummings Radium and in Lansdowne. Two-percent uranium ore was brought from Colorado to Lan the radium was extracted. The site of this business was a warehouse at the of Union and Austin Avenues in Lansdowne. The degree of contaminatio was initially evaluated as low, and did not justify remedial action. Howe extent of the problem was not discovered until 1991 by a suspicious neig subsequently found that 40 properties had been contaminated as a result of t

The warehouse turned out to be only the tip of the iceberg. C levels were low there because only the primary extraction had been done t detective work later revealed that the final extraction had been performed at twin house at 133 and 135 Austin Avenue. Then in the mid 1940s, the Austin Avenue burned down and was replaced with a new structure at warehouse. In 1987, this structure appeared to be an uncontaminate warehouse, not a part of 133 Austin Avenue. Hence the contamination Avenue, apparently not related to the warehouse, was not discovered at th question of the disposal of the tailings was never adequately answered. In people who had lived in the area at the time of the operation resulted in

none of which led to the tailings. The principal restoration properties and their relative positions in Lansdowne are shown in the map in Fig. 4.1.

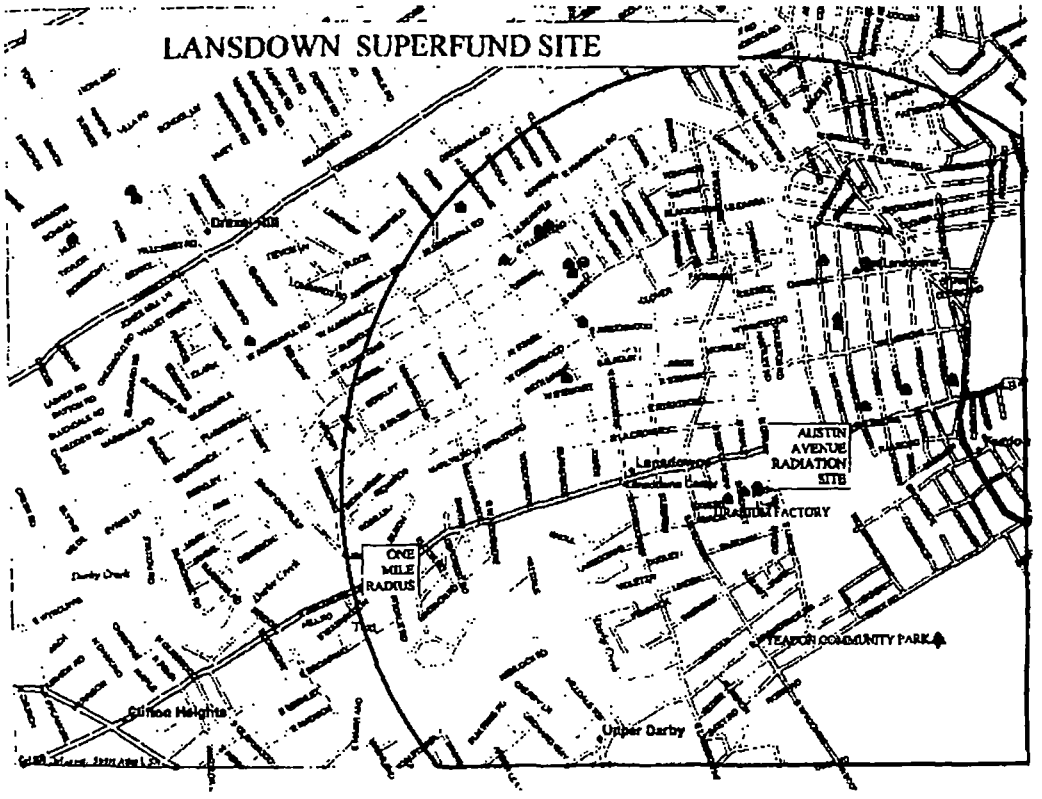


Fig. 4.1. The Lansdowne Superfund site plan. This plan shows the principal structures and their arrangement on the streets of Lansdowne, Pennsylvania.

4.2.2 The Trail of the Uranium Tailings

The discovery of the contamination at 133 Austin Avenue, made by a private citizen, led to a new search for the tailings. This time, a gamma scanning van was brought from EPA's Las Vegas laboratory. This van was equipped with a side-looking 4" x 4" x 16" sodium iodide detector, and was designed to look for uranium mill tailings. The original expectation was that the tailings would have been used as fill. It was expected that homes might have been built on the fill. The van was used to scan every street within a one-mile radius of the warehouse.

Instead of finding houses built on the tailings, houses built from the tailings were actually found. The mill tailings had been used in the mortar of the foundations of some houses. In other houses made of masonry, the tailings were in the mortar used to build the entire house. In other houses, the tailings were curiously isolated in a single wall or only a portion of the house. In three houses, the tailings had not been used in the masonry at all. Instead, they had been incorporated in the plaster of the interior walls, with no involvement of the foundation or masonry sections of the house.

4.2.2.1 The Union Avenue Warehouse. This was the site of a radium extraction process from about 1915 to 1922. Radium was extracted and purified from Colorado carnotite ore with about 2% uranium. There was also an experimental process under development capable of economically using 1% ore. It is not clear from today's records how much ore was processed and what its disposition was, though the ultimate disposal of most of the ore appears to be inclusion in nearby structures. The building appears to be contaminated throughout the original wood structure, and in the concrete slab on which the structure is built. Internal gamma levels range from background to about 100 μR/hr at 1 m, with contact in one spot on the floor at about 1 mR/hr. This later turned out to be the location of one of the original wooden extraction vats, and the floor of the vat was still in place below the concrete. The building was evaluated by a structural engineer and found to be too unsound to allow an intensive internal survey. It was spray painted on all interior surfaces to fix the contamination to allow it to be carefully dismantled. There is also significant contamination under the parking lot on the north side of the building.

4.2.3 The Big Picture

The Austin Avenue Superfund site eventually consisted of approximately 40 residential properties in the boroughs of Lansdowne, East Lansdowne, and adjoining jurisdictions. Of these, 28 required substantial cleanups. These sites are summarized in Table 4.1, with a description of the measurements that were made at the time of the initial survey given in Section 4.3. The measurements in both Table 4.1 and Section 4.3 were taken to assess exposure of the residents to decide on the need for relocation, and so were made on beds and in locations where people normally would be. This listing is provided to give the reader a feel for the situation, as it was known before a comprehensive survey was performed.

Table 4.1. Radiation characteristics of Lansdowne residential properties.

Address	Average Exposure Rate (μR/hr)	Maximum Exposure Rate (μR/hr + Location)	Contamination		Radon (pCi/l)
			Soil	Inside	
133 Austin Ave.	200	500 bedroom	Y	Y	150
131 Austin Ave.	25	70 porch	Y	Y	30
129 Austin Ave.		20	Y	N	
34 Lewis St.	600	1200 basement	N	N	150
246 Melrose	100	300 front rooms	N	N	
211 Penn Blvd.	50	70 living room	N	N	25
25 Lexington Ave.	400	500 bedroom	N	N	5
25 Beverly	250	420 bedroom	N	N	30
126 Owens Ave.	24	110 front porch	N	N	7.5
216 Wayne Ave.	90	150 living room	N	N	10
237 N. Lansdowne Ave.	30	100 living room	N	N	14
6 Plumstead Ave.	30	85 basement	N	N	25
218 Wayne Ave.	75	170 living room	N	N	18
310 Shadeland Ave.	35	110 office-desk	N	N	7
10 Plumstead Ave	40	200 basement columns	N	N	
3723 Huey Ave.	40	50 second floor	N	N	
64 S. Clifton Ave.	80	200 basement	N	N	17
617,619,621,623 Pine (semi-detached)	70	80 living room	N	N	48
500 Harper Ave.	260	320 basement	N	N	
346 Owen Ave.		150 front porch	N	N	
151 Lexington Ave.	70	250 foundation exterior	N	N	17
504 Harper Ave.	20	200 basement	N	N	
16 E. Plumstead Ave		200 basement	N	N	1.4
219 Wayne Ave.	80		N	N	15

4.3 INITIAL RADIOLOGICAL MEASUREMENTS TAKEN AT THE 28 CONTAMINATED RESIDENCES

4.3.1 133 Austin Avenue

Gamma levels throughout the structure averaged about 200 μR/hr, with 500 μR/hr at the location of several beds. The contamination appeared to be principally in the wood frame of the structure, though it was originally suspected that it is also in the stucco on the exterior of the building. When the building was finally dismantled, radium-contaminated dust was found under the floorboards, with radium content as high as 40,000 pCi/g. This is considerably greater than the original 5000 pCi/g of the ore, and indicates this house was used as a final processing location for the radium.

The yards behind 131 and 133 Austin Avenue were contaminated. One-meter gamma levels are about 70 μR/hr. This contamination appears to become less pronounced behind 129 Austin, and is not detectable behind 127 Austin with a gamma survey meter. This contamination was later found to be from an old cesspool that had been filled in with tailings.

4.3.2 Austin Avenue Vicinity Properties

Except for 131 Austin, the other homes on Austin Avenue were not found to be contaminated internally. Micro-R meter readings were all below 20 mR/h with no hot spots detected. There were a number of small hot spots, which appear to be due to concrete and mortar patches applied to local buildings. The highest contact gamma levels were about 50 μR/hr.

4.3.3 131 Austin Avenue

Soil was found to have a small amount of internal contamination, with overall gamma levels of about 25 μR/hr (10 above background). The only discernable hot spot was the floor of the front porch with gamma levels on contact of 70 μR/hr. The contamination pattern appears consistent with material tracked into the house. Radon is elevated in the structure. Grab samples yielded 30 pCi/l in the basement and 7 in the first floor. This may be due partially to contamination in the back yard.

4.3.4 34 Lewis Street

Gamma levels were fairly uniform across each floor of the structure, except for readings of 1,000 to 1,200 μR/hr in contact with the basement walls. Gamma levels were 600 μR/hr in the basement, 300 in the first floor, and 125 in the second floor; radon in living areas was about 150 pCi/l. The structure appears to be built on a brick

ndation with tailings used in place of sand in the mortar. There was also a masonry ıt porch made with tailings.

.5 246 Melrose Street

The building appeared to be contaminated in only one location in the mortar of a ne wall that faced the street. Other areas of the structure appear to be :ontaminated, including similar stonework in other parts of the structure. Internal nma levels are 100 μR/hr in room centers adjacent to the contaminated wall, with 300 /hr on contact. The foundation did not appear to be contaminated. There was no vious contamination in the second floor wall facing the street.

;.6 211 Penn Boulevard

Gamma levels were 70 μR/hr in the living room and 60-70 in one bedroom, and -60 in another bedroom. Radon was 25 pCi/l. As observed through survey :asurements, the contamination appears to be confined to the foundation from survey :asurements.

3.7 25 Lexington

Gamma levels were 160 μR/hr in the highest exposed bed. Another bed had 140 d a third bed had 100. The sitting room where the residents reported spending most of :ir waking hours was 60 μR/hr. The average living room exposure was 150. Radon ıs 8 pCi/l. The contamination appeared to be mainly in the plaster and stucco in this me.

3.8 137 Lexington

Gamma levels were 300 μR/hr in the center of the living room; 430 in the dining om; and 410, 500, and 260 on the beds. Radon was measured at 5 pCi/l by the survey ım that agreed with an earlier measurement by the homeowner. This is probably due encapsulation because of heavy vinyl and foil wallpaper that had been installed by the meowner, who is a wallpaper contractor. Contamination appeared to be in the plaster ılls and stucco, though the basement floor shows signs of contamination.

3.9 25 Beverly

Overall gamma levels were about 60 μR/hr in the basement, 125 in the first)or, and averaged about 350 throughout the second floor. Gamma levels were 420 R/hr in the second floor bedroom. Radon was measured at about 30 pCi/l.

4.3.25 219 Wayne

The contamination in this house appeared to be mainly in the foundation, though some hot spots were evident in the exterior stone walls. There was also a support pillar in the basement that had measurable contamination. Contact gamma levels from the basement walls and pillar ranged from 100 to 200 μR/hr. Hot spots on the exterior stone walls also ranged from 100 to 200 μR/hr. Room average gamma levels in μR/hr were 50 in the front porch, 100 in the living room, 80 in the dining room, 55-65 in the kitchen, 40 on the second floor, and 25 on the third floor. There is an addition that appears not to be contaminated. The second floor bedroom in this addition had 22-30 μR/hr. Radon was 9.5 pCi/l in the dining room and 15 in the basement.

4.4 THE LANSDOWNE SUPERFUND

The concept of the Superfund was established by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, which was reauthorized by Congress in 1986 and 1990. The purpose of the program is to protect public health and the environment from the release, or threat of release, of hazardous substances. This protection can range from "removal" actions to control emergency situations, to more permanent long-term "remedial" actions. The Austin Avenue Radiation Site underwent both removal and remedial actions.

The Lansdowne site consisted of 40 properties in six municipalities that were contaminated with radium and thorium, which are considered health hazards when inhaled or ingested. Under a removal action, 18 of the properties were decontaminated and restored at a cost of $24 million. The remaining 22 properties were addressed through the remedial program at a cost of $31 million. The remedial cleanup included demolition, sampling, excavation, and disposal of the radiologically contaminated materials, temporary and permanent relocations of the homeowners, and reconstruction of the houses. Regarding the 22 properties, initially EPA Region 3 wanted to demolish most of the contaminated structures and permanently relocate the owners into replacement houses. However, due to public and political pressure, the EPA allowed most of the owners the options to either relocate or to have new houses built on site. Ten of the owners chose to rebuild. Eight of the owners chose to permanently relocate. Four of the owners were not given a choice as to how their properties were to be remediated because local zoning laws would not allow an equivalent structure to be built on the property due to more recent set-back requirements.

4.4.1 The Remedial Action Plan

The EPA Region's original intent was to relocate the owners, as had been done at other Superfund sites in the past. Although the USACE was quite experienced with

ating people into comparable houses, neither it nor EPA Region 3 were experienced uilding new houses. Moreover, building new houses required more involved tiations with owners and more oversight on the part of the government. ırdingly, on 1 July 1993, EPA Region 3 issued a Proposed Remedial Action Plan \P), which explained that EPA would permanently relocate the owners into parable housing and demolish most of the houses. In response, however, the Region ived over 700 form letters protesting the proposed relocations and demanding that build new houses. The arguments presented against relocating the owners ıded: dwindling property values, shrinking tax base, and the fear that EPA would e the municipalities with abandoned lots. The Region, on the other hand, argued that rmer Superfund site, in the same area with the same problem, had relocated the ers, demolished the houses, and cleaned up the site upon which four new houses now d generating tax revenue. The Region also preferred relocation over building ıuse it would cost less, and because regional personnel were inexperienced with ding houses and negotiating housing amenities with owners.

2 The Heartache of Compromise

On 24 August 1993, the Acting Regional Administrator received a letter signed two Senators and three Congressmen. The letter strongly urged the EPA to ınsider its preference for the relocation, which seemed based on financial sideration, and to build new houses. In the meantime, the Region had requested EPA ıdquarters (Director, Office of Emergency and Remedial Response) to determine if ıerfund monies could even be used to build new houses, pointing out that Agency ons at this site may set precedent for future remedial actions at other sites. On 19 ober 1993, the Acting Regional Administrator again asked for a decision, explaining : the local officials were planning to approach the Administrator, and that he was ler considerable pressure to finalize the Agency's position on this situation. On 17 :ember 1993, EPA Headquarters (assistant Administrator for the Office of Solid :ste and Emergency Response) informed Region 3 that it could and should build new ıses that were equivalent to those in place prior to demolition. However, no guidance sted on how to go about this process.

The Region issued a revised PRAP on 2 March 1994, which offered many of the ners the option to rebuild, but asserted that five of the properties could be repaired. sed on community response, EPA modified the revised PRAP. On 27 June 1994, the :ord of Decision stipulated that 18 property owners, including four whose houses that l, been slated for repair, could have the option to relocate or have their houses rebuilt. n of the owners took advantage of this option. Thus, Region 3 and the USACE now uctantly entered the custom house-building business.

The ROD also specified that the lot that housed the former Cummings Radium fining operation must be excavated to remove the radiologically contaminated soils.

4.4.3 Balancing Housing Costs vs. Political Pressure

The Region knew it would cost more to build new houses than to take advantage of the USACE's expertise and relocate the owners. EPA spent an average of $651,700 each to rebuild 10 houses whose appraised value averaged only $147,000. Refer to Figs. 4.2 through 4.6, which show the progress of the remediation. (Fig. 4.2 is found in the Color Photo Section, Color Photo 1.)

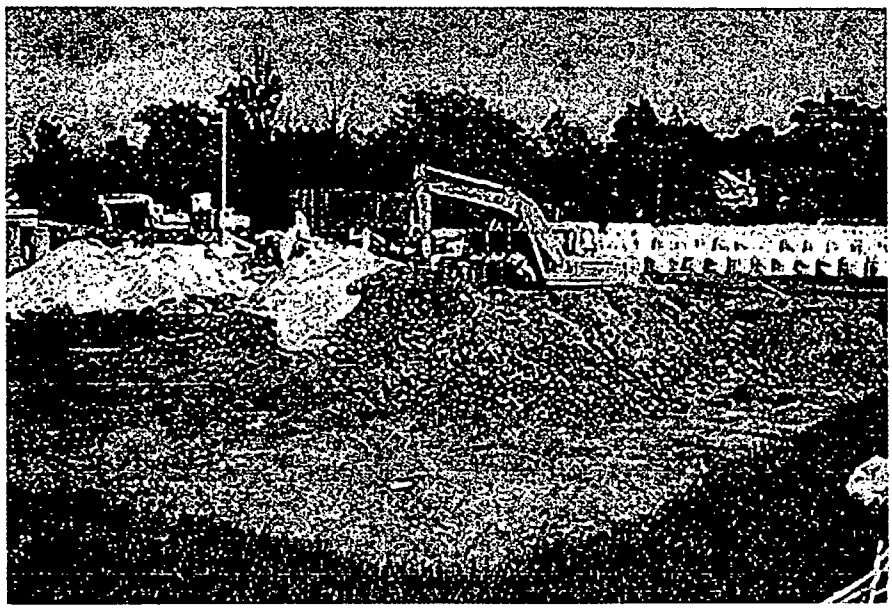
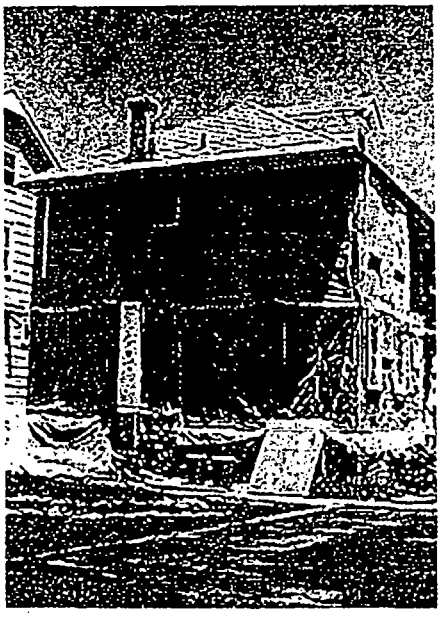


Fig. 4.3. Yeadon Community Park decontamination job. Note the large pile of 1-cubic-foot soil containers.

Fig. 4.4. The infamous "hot sidewalk." A constant air monitor is in the center of the sidewalk.



ig. 4.5. Most of the mortar in this house had been made from uranium tailings. The ost of this rebuild was about two to three times the appraised house value.

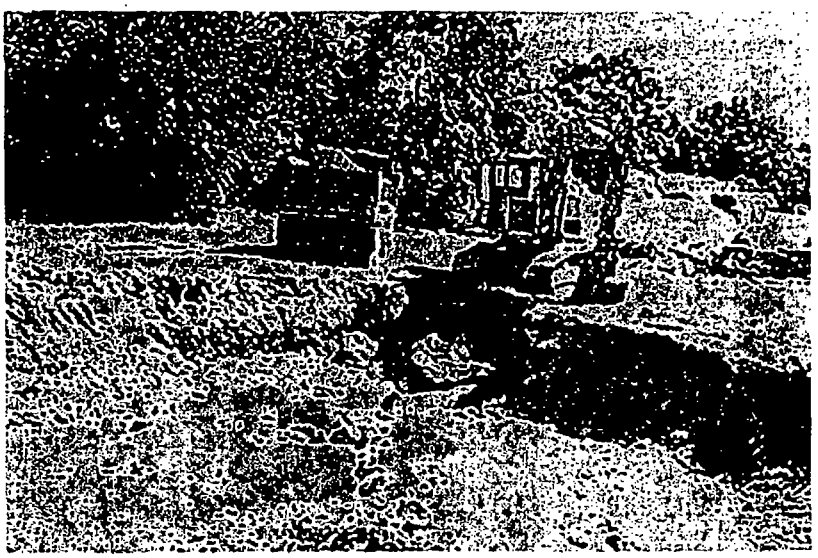


Fig. 4.6. Excavation of The Children's Park.

Regional personnel explained that part of the high cost was attributable to federal mandates such as the "Davis-Bacon" and "Buy American" Acts. They also explained that these houses cost more to build because the Region had replicated as closely as possible the original houses "to make the owners whole again." This decision to replace "like for like" coupled with demands of some of the owners resulted in higher total costs than a relocation to comparable existing houses. In dealing with the owners, EPA utilized the services of individuals from a variety of occupations including architecture, interior design, botany, and in one instance, psychiatry.

Personnel from the USACE, Region 3, and the architect negotiated with property owners over the custom design of their new houses. During these meetings, each owner was afforded the opportunity to choose their amenities, such as cabinets, bathtubs, and tiles. Although EPA was extremely generous in the building of the new houses, there were complaints, most of which did not appear warranted. Moreover, some of the cost increases were directly attributable to such complaints as well as the fact that some owners were more demanding than others in reaching "comparability" with the houses being replaced.

4.4.4 The "Heartache" Property

This property was demolished and the owner received a custom-built house. The contaminated property was a three-story house purchased in 1989. In 1992, the owners stopped paying the mortgage and by 1994 faced foreclosure.

The property was described as "run-down, unmaintained, and in a large portion, structurally unsound." The architect classified the building as being in fair to poor condition, noting that "most all of the existing roofing/porch structure was rotted or failed." The appraised value of the property was $161,000. The reconstruction cost EPA $700,000 in direct building costs. EPA also spent $100,000 in moving, storage, and rental fees.

Whereas most other owners required three meetings, this individual required five meetings and numerous phone contacts to discuss the amenities for the new house. According to Region 3 personnel, part of the problem was his inability to come to a decision, and part of the problem was his overt intention to get the best of everything. For example, he demanded a cedar roof because a neighbor had gotten one. He wanted his kitchens upgraded and demanded crystal lighting fixtures and an oversized tub installed on a platform to accommodate two people. When Region 3 refused these demands as unwarranted, he claimed that EPA was unfair and had lied to him.

As a result of this individual's insistence on extensive design changes, upgrades, and tradeoffs, the new house received a second terra-cotta flue from the basement, a second electrical panel in the basement, a powder room in the basement, 42" kitchen cabinets (instead of the standard 30" cabinets), a second stairway from the kitchen to the basement, a bay window in the kitchen, and a library on the first floor with cabinets and a sink.

Despite the Region having made extensive design changes and concessions, when it came time to move out of the contaminated house, this individual refused. Unless his temporary relocation demands were met, he threatened to "create a disruption and a media show." As the impasse continued, the Region contemplated contacting the U.S. Department of Justice to seek assistance in dislodging this individual from the premises. Such actions, however, became unnecessary as he finally agreed to temporarily relocate.

Finding a temporary house also presented a problem. This individual refused to consider any of the comparable houses shown him. He demanded to be housed in a mansion, with an in-ground swimming pool situated on 20 acres. The Region refused and instead placed him in a comparable relocation property described by the RPM as being "immaculate" and "a house anyone would be happy to call home." Although this individual finally agreed to relocate to this "dump" as he put it, he still expressed concern that it was too small to accommodate his "stuff." This included items such as used tires, automobile mufflers, and planks of wood.

Actually, moving this individual also proved expensive. EPA spent $33,864 to move his belongings, plus an additional $13,990 to rent storage areas ($9750 for heated storage and $4,240 for unheated storage).

Finally, upon entering the contaminated house, the upper two stories were inaccessible because this individual had taken the stair treads and banisters. Upon further investigation, it was learned a variety of other items had been taken: light fixtures, door knobs, door jambs, window mounting hardware, cabinets, the heater, sinks, and toilets.

On the other hand, EPA did refuse to authorize a variety of demands, such as the oversized bathtub, cutting board insert for the sink in the library, excessive telephone line installations, a full bathroom in the basement, imported porcelain tiles, excessive landscaping features, and a new garage. EPA also refused to pay the owners $50,000 for their unpaid mortgage.

In October 1997, the new house was complete. However, the individual was unable to move in because the municipality refused to issue a "use and occupancy" (U & O) certificate for the house, despite the fact that the EPA had paid the municipality total inspection fees of $40,125 or an average of $5,700 to inspect each of the new houses. Specifically, the municipality objected to a detached garage, which is classified as a "blight determination." Although the Region pointed out that the poor structural condition of the garage existed prior to EPA's involvement at the property, and that the garage was not part of the project because it was not contaminated, the municipality demanded the garage be replaced before it would issue a U & O Certificate.

Coincidentally, this objection was raised because of a complaint by the owner of an adjoining property who: (a) was also receiving a new house from EPA, and (b) was a local government official deeply involved in many of the negotiations with the Region over the site. In December 1997, the municipality finally issued a conditional U & O certificate.

To summarize, EPA spent over $700,000 to build the house and $160,981 in indirect costs. It replaced a house appraised at $161,000. EPA has also spent an additional $100,000 in moving, storage, and rental fees for this individual. Refer to Table 4.2 for rebuilding costs of all houses. These costs are line items from a fixed-price contract awarded to rebuild the houses.

Table 4.2. The heartache of rebuilding costs.

Property	Appraised Value	Direct Rebuild Costs	Indirect Costs	Total Cost
A	103,000.00	354,360.00	169,981.00	524,341.00
B	114,500.00	277,693.00	169,981.00	447,674.00
C	120,500.00	390,628.00	169,981.00	668,321.00
D	141,500.00	422,175.00	169,981.00	592,156.00
E	153,200.00	507,878.00	169,981.00	677,859.00
F	155,000.00	360,395.00	169,981.00	530,376.00
G	161,000.00	706,010.00	169,981.00	339,962.00
H	161,500.00	489,816.00	169,981.00	659,797.00
I	162,700.00	487,449.00	169,981.00	1,738,822.00
J	200,000.00	911,411.00	169,981.00	1,081,392.00
Total	$1,472,900.00	$4,907,815.00	$1,699,810.00	$7,260,700.00

4.5 THE HEARTACHE OF THE RADIONUCLIDE RATIOS (A MOVING TARGET)

Figs. 4.7 to 4.10 show the concentrations of the major uranium, thorium, and um constituents in the various matrices associated with the Lansdowne structures areas.

The ratios of these elements vary based on the form of the starting materials and industrial processes used in each location. Four phases in the radium separation ess were identified. In Phase I the raw, unprocessed ore was stored. The raw ore a fine, sand-like consistency. The ^{238}U, ^{230}Th, and ^{226}Ra were in approximate ilibrium and the resulting waste stream consisted of the unprocessed ore residues. In se II, the ore was leached with hot hydrochloric acid. The resulting waste consisted narily of tailings with relatively greater ^{230}Th and ^{226}Ra and little uranium. Phase involved the transfer of the hydrochloric acid leachate followed by the addition of te and sulfuric acid to produce a coprecipitation of barium sulfate and radium sulfate. remaining liquid contained uranium sulfate and was either disposed of as liquid te or recycled to extract other rare earth elements. The Phase III waste tended to e little thorium and radium and consisted primarily of ^{238}U. Phase IV involved the olution of the radium and barium sulfates in hydrocholoric acid. The radium oride was separated from the barium chloride by fractional chrystalization. The waste am was a liquid containing relatively little thorium and uranium and whatever ium was not recovered in the crystalization process.

The radionuclide ratios found at the Superfund sites were a function of the process phases in use described above as well as when the waste was generated in the life-cycle of the plant. As the plants were used more, the overall process efficiency for extraction of the radium improved, thereby resulting in wastes that were lower in radium and relatively higher in thorium and uranium. Another factor that determined the concentration of radionuclides in the waste was how the waste was handled, used, or disposed of and the natural processes to which it was subjected. For example, waste could be used as fill or in building products such as brick and mortar, or it could be recycled for rare earth extraction. Natural processes including rain washing, relative acidity of rain water, and radioactive decay would cause the resulting radionuclide mix to change. Natural washing tended to remove the mobile species leaving the insoluble materials behind. The way in which waste forms were used also affected the concentrations of radionuclides found at the various Superfund sites. Some of the waste material was used directly while other portions were diluted with "clean fill" such as sand in the case of mortar and concrete. The extent of mixing also affected concentrations. Some mixed constituents had patchy concentrations of radionuclides.

4.6 CONDUCT OF HEALTH PHYSICS DURING REMEDIATION

4.6.1 The Health and Safety Plan for Remediation

The criteria used was that the concentration averaged over 100 m² in the top 15 cm of soil be <5 pCi/g ^{226}Ra above the normal background with no single sample exceeding 15 pCi/g ^{226}Ra above the normal background. Below the top 15 cm, the criteria were that the concentration, averaged over 100 m², be 15 pCi/g ^{226}Ra above the normal background with no single sample exceeding 45 pCi/g ^{226}Ra above the normal background. The normal background for the site is taken to be 2 pCi/g of ^{226}Ra (based on several samples of "non-affected" areas surrounding the site).

4.6.2 Health and Safety Project Plan Philosophy

The degree of radiological hazard involved with this project is expected to be small and easily controlled. The radiation exposure from the low-level radium (^{226}Ra) contamination in the Lansdowne warehouse is not expected to present a whole-body radiation hazard. However, as a precaution, personnel dosimetry and other measures will be utilized to document this fact.

It is also expected that no significant surface contamination or airborne radiation hazard will be present due to the low contamination levels found so far at the warehouse. However, routine dose rate and surface contamination surveys as well as air sampling and other precautionary measures will be performed. Equipment such as alpha survey instruments, μR meters, air samplers, protective clothing, respiratory protective

ment, etc., will be available and utilized at the discretion of the Radiation Safety er.

Austin Avenue Site Radiological Environmental Monitoring Program

1. Scope of the REMP. On 29 January 1992, the Radiation Safety Office began tions at the Austin Avenue Radiation Site. A Radiological Environmental toring Program (REMP) was established by the Radiation Safety Officer (RSO) to ct data measuring the impact of Emergency Removal Operations on the radiological onment in the vicinity of the site. This program consists of continuous particulate mpling at a minimum of four locations, with Calcium Sulfate TLDs co-located at r sampling stations. Also, experimental Electret Ion Chamber Dosimeters were co- ed at three of the REMP stations as a quality assurance cross-check. Due to the nic nature of this project, some of these monitoring stations had to be moved as lition progressed. Additional stations were also added to the network several times ghout the year to provide data for remote sites.

The majority of operations were performed within a one-block area bounded by n Avenue to the South, S. Union Avenue to the East, the SEPTA R-3 West Chester oad line to the North and S. Maple Avenue to the West. Additional Radiological onmental Monitoring was performed in the vicinity of operations at Yeadon nunity Park, approximately ¼ mile south of the main site and at 25 Beverly ue, approximately ½ mile northeast of the main site. Temporary (daily) downwind mples were also frequently used at other "quick-fix" sites for short duration.

2 Summary of REMP Air Sampling Results. A total of 244 particulate air les were performed at all eight stations. Of these, seven samples were lost or wise compromised (e.g., sample pump failures), resulting in 97.1% recovery of les; 237 samples were analyzed on-site by gross alpha counting. Of the 237 les counted, 157 were below our laboratory's Lower Limit of Detection (LLD). verage LLD for these samples was 5.8×10^{-15} µCi/ml; 80 samples were positive. verage concentration for positive samples was 7.2×10^{-15} µCi/ml. These values spond to a Committed Effective Dose Equivalent (CEDE) of 1.3 mrem/year for the ge LLD and 1.6 mrem/year for the average positives.

3 Summary of REMP TLD/Electret Results. Thermoluminescent dosimeters s) were also located at the REMP stations to measure the ambient gamma radiation sure. The TLDs were changed out approximately once per quarter. Additional were located in work areas to act as area dosimeters. The TLDs used were yne Isotopes Calcium Sulfate TLDs designed to detect gamma radiation or x-rays (This type of badge is not sensitive to alpha or beta radiation.) TLDs used to nine the absolute background were stored in lead containers at the Porter

Consultants, Inc., offices in Ardmore, Pennsylvania and at Teledyne Isotopes facility in Westwood, New Jersey. The TLDs stored at Porter Consultants were also used as in-transit controls. Based on readings of the control badges and recommendations from Teledyne Isotopes, an average in-transit dose of 0.9 mR was subtracted from each environmental TLD to determine net exposure.

A total of 23 TLD readings were obtained in 1992. The average dose rate for all the TLDs was 8.3 R/hr (2.6 R/hr). The average dose rate for the four quarterly background TLDs was 6.3 R/hr (0.7 R/hr) and for the 19 "Active" TLDs, 8.7 R/hr (2.7 R/hr) for a difference of 2.4 R/hr. In other words, the TLDs in the vicinity of the removal sites were approximately 38% above the background location. However, it must also be noted that the sites of the REMP stations are very different. For example, the background station is located on the roof of the two-story brick Lansdowne Municipal Building while some of the other sites were located approximately 1 meter above ground level. When the raw data are examined, however, it appears that most of the difference was caused by two high TLD readings: one at 133 Austin Avenue (when the TLD was located in the Guard Trailer, which was known to have a dose rate about twice the normal background), and one from 25 Beverly Avenue which was likely due to poor statistics caused by the very short exposure period (only 11 days). In any case, the average dose rate at each of the individual stations was 13 R/hr, which is within the normal range for this geographical area (even when the higher samples are included).

4.7 CONCLUSIONS OF THE EPA INSPECTOR GENERAL

"We believe that the EPA should not be involved in the house-building business. While we understand that the Agency believed it needed to build the new houses to achieve community acceptance, we believe it was more generous than it had to be. The Region gave each owner a custom-built house replicating the intricate workmanship of the original house. As a result, the government built 10 houses paying an average of $651,700 each, when the original houses were appraised at an average of only $147,000 each. Finally, EPA and the USACE encountered considerable complications from local governments and from some of the owners who were to receive the new houses.

There is currently no policy available regarding the building of houses under Superfund. Region 3 asked EPA Headquarters to decide if houses could be built. EPA Headquarters replied that they could, but provided no instructions, policy, or guidance. The Inspector General found no evidence to suggest that the EPA was mandated to replicate the houses that had existed at the Austin Avenue Radiation Site. We believe that the Agency should consider other options instead of building new houses. One option that was previously suggested by the USACE for this site was to compensate the owners for the fair market value of the properties to enable them to arrange for the rebuilding of new homes on their existing lots.

However, before this type of situation arises again, where EPA builds houses, the Agency should have in place explicit parameters to define what equivalent housing means. We do not believe that the Agency should be obligated to build customized replicas of the original houses."

4.8 FUTURE SUPERFUND SITES

Based on the experience at the Austin Avenue site, the EPA will proceed with extreme caution in any future situations where replacement of buildings may be involved. It is now EPA's policy not to rebuild residential or commercial structures except under the rarest of circumstances. A formal EPA policy is expected to be in place in late 1999, and until that time any replacement of structures will be carefully evaluated and centrally coordinated.

4.9 FURTHER READINGS

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Florida Department of
Environmental Protection

Memorandum

TO: Wetlands on Clays 2000 Re-Assessment Group & Other Interested Parties

FROM: Bud Cates, Program Administrator BC
Bureau of Mine Reclamation

DATE: April 19, 2001

SUBJECT: Guidance in the Reclamation of Forested and Herbaceous Wetlands on Phosphatic Clay Settling Areas ~ Final Document

The Wetlands on Clays 2000 Re-Assessment Group would like to present the final document entitled: **Guidance in the Reclamation of Forested and Herbaceous Wetlands on Phosphatic Clay Settling Areas** (attached). Much hard work and consideration has gone into the production of this document. Its usefulness will ultimately be measured by the implementation of the guidance contained within and the commitment of the implementers to continual refinement.

Please note that this guidance does not provide a magic formula for regulatory approval, nor does it assume that "all will be well" if the guidance is followed.
This document provides insight into the current "state of the art" of clay settling area reclamation and a basis for potentially successful reclamation of wetlands on clay settling areas. Field application of this guidance, demonstration that it works, and continued refinement of its methodologies over time are the only "reasonable assurances" of its efficacy. Furthermore, it should not be assumed that regulatory approval for wetland disruption / mitigation will be based on future, planned demonstration. Understanding of the tools provided, a willingness to utilize the tools, and implementation of the tools by demonstration will be required prior to the approval to mine wetlands that will then be mitigated for on clays.

This guidance is not a change in statute, rule, or official policy with respect to the reclamation of wetlands on clay settling areas. It is, however, a change in operational perspective. As with most human endeavors (the Law, Medicine, Communications, Space Exploration, and Mine Reclamation), change and evolution are the essence of progress.

If you have any questions regarding the document or the regulatory implications of this change in operational perspective, please call me or Orlando Rivera at (850) 488-8217. You may also contact us via electronic mail by using the addresses:
Bud.Cates@dep.state.fl.us or Orlando.Rivera@dep.state.fl.us .

Attacment

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GUIDANCE IN THE RECLAMATION OF FORESTED AND HERBACEOUS WETLANDS ON PHOSPHATIC CLAY SETTLING AREAS

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF MINE RECLAMATION

APRIL 19, 2001

GUIDANCE IN THE RECLAMATION OF FORESTED AND HERBACEOUS WETLANDS ON PHOSPHATIC CLAY SETTLING AREAS

* CONTENTS *

I. **INTRODUCTION / PURPOSE & INTENT:** At the inception of statutorily required mandatory phosphate mine reclamation (circa 1981) and throughout the following decade, conventional wisdom held that phosphatic clay settling areas (CSA) could not be reclaimed to predictable landforms. Early reclamation methodologies for clay settling areas mostly involved passive de-watering of the impounded area. Due to the internal structure of older CSAs this methodology resulted in inconsistent de-watering across the overall impoundment; as well as slow and inconsistent clay consolidation. Advances in CSA reclamation methodologies would be necessary before predictable and stable landforms could be achieved. As late as the mid-1980's, active and aggressive de-watering for the purpose of clay consolidation was new to the phosphate mining industry.

In 1991 regulatory circumstances determined that there was a need to evaluate the status of reclamation design, methodology, and performance with respect to CSAs in general, and wetlands on CSAs in particular. Staff of the Florida Department of Natural Resources (now Department of Environmental Protection), Bureau of Mine Reclamation (BOMR) was selected to perform the status assessment. This status assessment was performed and findings documented in a report entitled **Status Assessment of Reclaimed Clay Settling Areas with Forested and Herbaceous Wetlands** (J.Callahan, O.Rivera, B.Cates / April 1991). Resulting from this status assessment, a draft policy was developed by the BOMR that precluded the assignment of regulatory credit to wetlands constructed on CSAs. Although the draft policy was not formally adopted, its conclusions and proposed ramifications have been normal practice since 1991.

In May 2000, regulatory interactions between the BOMR, the phosphate industry, and environmental/engineering consulting firms indicated that the "state-of-the-art" of clay settling area (CSA) reclamation had advanced considerably over the past decade. A re-assessment of the 1991 findings and resulting regulatory status quo was determined to be appropriate. The purpose of this document is to briefly synopsize the findings of the 1991 status assessment, explain the parameters of the 2000 re-assessment, compare the findings of the two, and provide current conclusions regarding the efficacy of wetland reclamation on CSAs.

II. **History & Background of the 1991 Status Assessment**: After an approximate decade of regulation with respect to the mandatory reclamation of phosphate mines (1981-1991), it was determined that a general evaluation of reclamation design and performance was needed. Today this type of overall product evaluation has become continual; however, in 1991 the complicated nature of CSA reclamation was just beginning to be understood. The BOMR proposed to evaluate the reclamation of wetlands on CSAs, as accomplished by the date of the original status assessment, and provide a prospectus regarding the "state-of-the-art" circa 1991.

A. **Problem Statement**: Above-grade storage of waste phosphatic clays results in a significantly long operational life for CSAs. Likewise, reclamation of CSAs constitutes a lengthy, complicated, and costly process. In 1991, many non-mandatory

CSAs were out-of-service and eligible for reclamation; however, few mandatory CSAs were so positioned. Therefore, the first decade of governmentally regulated reclamation had resulted in the completion of reclamation on but a few CSAs industry-wide. Of those reclaimed, the majority consisted of non-mandatory areas reclaimed to a less stringent standard than that imposed by mandatory reclamation rules. "Wetlands" resulting from this scenario were more a product of happenstance than design and construction based on developed knowledge. This situation provided little impetus to advance a large body of knowledge regarding CSA reclamation design and methodology.

At this same juncture, several applications for mandatory reclamation approval on CSAs that were to contain reclaimed wetlands as replacement of regionally-significant, impacted wetlands gave the BOMR reason to question the efficacy of current designs and methodologies. Evaluation of the first decade's progress in achieving the desired reclamation product was therefore undertaken.

B. **Methodology**: To facilitate the 1991 assessment, the assigned BOMR staff devised data collection worksheets. Background and historical information was obtained from application and inspection files, and by direct interview of BOMR inspectors and industry representatives. It was determined that reclamation, including wetlands, had been completed on twelve CSAs. In April of 1991, BOMR staff performed field surveys of all twelve existing sites. Upon conclusion of the field surveys, data from the worksheets was tabulated, results discussed, and conclusions and recommendations presented in document form.

C. **Results (Issues-of-Concern Identified):** Four major parameters were identified that were thought to be of critical importance in the successful reclamation of wetlands on CSAs. The four parameters were (1) the nature of the clays and presence of other soils within the site, (2) hydrology of the site, (3) revegetation and site management, and (4) the planned habitat objectives. The clays and other soils of each site were evaluated for factors relevant to their ability to provide predictable post-reclamation hydrology, plant growth medium, and generally appropriate wetland substrate. These factors were found to be dependent upon the method and extent of de-watering, clay consolidation, presence and extent of sand-tailings, location of sand-tailings, presence of unmined areas, and presence of overburden spoils. Field observations were made of current water levels and seasonal high water indicators to evaluate attainment of design goals. Revegetation efforts were evaluated for initial stocking density and diversity, growth parameters, and survivability. Extent of post-reclamation site management was noted. Habitat objectives were evaluated for attainment of design goals. A brief synopsis of each Issue-of-Concern is supplied below. Further explanation of each issue area is contained in the original assessment (copy attached):

1. Clays and other soils: The extent of de-watering was found to be directly proportional to the degree of clay consolidation and tilth. Clay consolidation and tilth were found to be directly proportional to the predictability of topography and accomplishment of planned post-reclamation hydrology and wetland substrate. Presence of internal sand-tailings and overburden spoils were found to represent

both obstacles to clay de-watering and potential benefits for wetland construction. Inadequate de-watering (and consolidation) of the clays was found to prevent optimized, beneficial utilization of these other soils.

2. Hydrology: CSAs were perceived to present a hydrologic regime that is significantly different from that of most natural wetlands. The extent of differences and similarities of parameters in these regimes were a mixture of conjecture and the prevailing knowledge in 1991. None of the assessed CSAs demonstrated that the unknown variability of these parameters could be identified, quantified, and synthesized into a reclamation product that assured the long-term viability of a wetland.
3. Revegetation: Although original diversity and stocking rates were commensurate with rule criteria, survivability and growth rates demonstrated a significant variability. Three factors were found to be the primary causes of the variability in plant survival and growth. These factors were unpredictable landform character, hydrology and competition from nuisance/exotic plant species.
4. Habitat: Attainment of planned habitat objectives is directly proportional to attainment of floral diversity and density. Low to moderate success rates for revegetation efforts resulted in communities with low survivability; and which were struggling to compete with nuisance/exotic species. Lack of post-reclamation habitat management, in conjunction with unpredictable hydrology, appeared to be relevant in causing this result.

D. **Conclusions**: The 1991 assessment concluded that although knowledge of CSA reclamation was improving, a greater effort was necessary in order to adequately advance the "state-of-the-art" to a point where an appropriate product was achievable. This assessment acknowledged the need for further research and experience in the areas of clay consolidation methodology and prediction, hydrologic construction and prediction, and revegetation / habitat management. The overarching conclusion drawn was that "very few" of the assessed CSAs "present an observable inclination toward long-term wetland re-establishment and viability".

III. PURPOSE OF THE 2000 STATUS RE-ASSESSMENT: In the year 2000 and preceding months, the BOMR, the phosphate mining industry, and multi-variate environmental/engineering consulting firms have been involved in complex regulatory evaluation of several new and/or expanded phosphate mining operations. The expanded role of federal, regional, and local governments in these regulatory evaluations, as well as the increased involvement of environmental organizations and the general public, have brought increased scrutiny with respect to the final reclamation product. The BOMR's role in regulatory oversight of the industry became more inclusive with the addition of wetland resource permitting responsibility in 1993, and National Pollutant Discharge Elimination System (NPDES) permitting responsibility in 1997. Since 1991, ongoing discussions and pursuit of new CSA reclamation methodologies and technologies are producing considerable advancements in the "state-of-the-art". General concerns now focus on a better overall appreciation of how and why phosphate mine reclamation/mitigation must be planned to provide a balance of post-reclamation land

uses and protections of post-reclamation water quality and quantity. These factors were key in determining that a re-assessment of the status and perspective regarding wetland reclamation/mitigation on clay settling areas (CSA) was appropriate and necessary.

A. **Perspective**: Through continual discussion, application of trial-and-error advancements in reclamation methodologies and developing technologies, and research coordinated through the Florida Institute of Phosphate Research, the past decade has seen significant advancements in the overall practice and body of knowledge with respect to general CSA reclamation. Most importantly, research and development have provided a better understanding of the complexity and dynamics of clay consolidation and overall CSA hydrology. Improvements in the use of technology coupled with experience and calibration now provide reasonable tools to integrate and predict ultimate consolidation and hydrology. Field application and continued refinement of these tools will be required to achieve the desired reclamation product.

B. **Methodology**: In May of 2000, a team of BOMR and industry representatives was designated to perform the Wetlands on Clay Settling Areas Status Re-Assessment (WOC Team). This team was comprised of biologists, wetland scientists, and reclamation engineers with considerable experience in phosphate reclamation issues. Environmental, engineering, and hydrological consultants with considerable involvement and experience in reclamation research and development, were called upon to discuss CSA "reclamation tools" advancements. Through a series of meetings, the WOC Team decided that a primary objective was to address the four "Issues-of-Concern" that were delineated in the 1991 Status Assessment. In order to address these issues, and potentially identify others, a series of inter-active seminars and site visits were held. Understandings imparted through the inter-active seminars were discussed and compared with field applications during site visits. Most of the original twelve CSAs assessed in 1991, as well as more recently reclaimed CSAs-with- wetlands in north and central Florida, were visited by the WOC Team.

C. **Results**: Of the original 1991-assessed sites that were re-assessed, the team found conditions similar to those originally delineated. In most cases, some wetland vegetation persisted and evidence existed of periodic soil inundation / saturation. Trees, surviving in densities approximating 1991 levels, exhibited good growth rates. Understory of desirable species was highly variable depending upon extent of invasion of nuisance species and management regimes. Newer sites, reclaimed after 1991, exhibited better hydrology and vegetation characteristics. All of the sites visited were valuable from the standpoint of demonstrating that: (1) the original "issues-of-concern" are valid, and (2) aggressive pursuit of improved methodologies will result in improved reclamation.

1. Clays and Other Soils: Predictable consolidation of clays (and resulting topography) remains a key factor in the success and sustainability of wetlands created on CSAs. Recently developed clay consolidation prediction methodologies provide a valuable tool in the design and prediction of clay

reclamation parameters. Calibration of predictive models, and the resulting reliability of the model results, is highly dependent upon the amount and accuracy of data used for calibration. All available data regarding the construction and operational history of existing CSAs should be gathered and utilized. Likewise, new CSAs should be planned with the realization that retention of pre-construction through post-operational data is critical to model calibration and reclamation planning. Continuing research into the role of overburden spoils, unmined areas, and sand-tailings within existing CSAs will aid in reclamation planning of these older areas; as well as their potential planned-use within new CSAs. Likewise, continuing research into the dynamics of crustal development will further aid the reliability of clay consolidation prediction. Application of available predictive modeling tools should be expected to result in reliable predictions of topography of CSAs.

2. Hydrology: More accurate prediction of final topography and the hydrologic integration of both clay and non-clay parts of CSAs will have a significant effect on the design of sustainable wetlands on CSAs. Improved clay de-watering methodologies, improved understanding of the interaction between clay consolidation and hydrologic behavior, and improved understanding of overall CSA hydrologic dynamics dependent upon CSA construction and operation will have a similar effect. These innovations combined with developing knowledge and experience in CSA post-reclamation water control structure design should result in a scenario that, once appropriately applied, will demonstrate the achievability of the hydrologic regime necessary for sustainable wetlands. The hydrology of CSAs can therefore be reliably predicted for wetlands and other landforms.

3. Revegetation: Appropriately planned and implemented vegetation diversity and density schemes are also a key factor in achieving a functioning and sustainable wetland. Assuming that hydrology and substrate have been adequately designed and constructed, initial and eventual plant diversity and density will be the next-level determining factor regarding propensity of successful wetland function. Management and monitoring practices should be similar to those used for all other reclamation and mitigation wetlands. Formally-sponsored and less-formal industry/agency applied research should continue with respect to design and schedule of revegetation schemes, nuisance plant control, and overall vegetation management practices. Clays have demonstrated to provide a suitable growing medium for wetland and other vegetative species. Establishment of appropriate hydrology, coupled with planting of appropriate species, should result in a diverse wetland community, whether forested or herbaceous.

4. Habitat: Quality wetland and adjacent-buffer habitats are obviously a direct function of appropriately designed and executed clay consolidation > hydrology > and revegetation. Adjacent post-reclamation landforms and land uses should be compatibly planned in order to reduce the potential of adverse impacts to the wetland. Assuming that these factors have been appropriately designed and

executed, viability and quality retention will be dependent upon the type and term of management practices applied. Long-term habitat management objectives should be incorporated into a management plan. Management practices will be further developed and modified based on periodic review of the collective experience. Like wetlands constructed in other types of reclamation, creation of wildlife habitat in wetlands on CSAs is dependent upon hydrology, revegetation, and the surrounding landscape.

D. **Conclusion**: Results of the 1991 Assessment indicated that the wetlands-on-clays existing at that time provided little assurance of quality, viability, or sustainable function. The 1991 Assessment did, however, serve to generally delineate issues related to inadequacies in design, construction, and management; as well as inadequacies of knowledge and experience with respect to these factors. The decade following the initial assessment saw considerable investigation into this lack of knowledge and the development of new and innovative methods and technology. Results of the 2000 Re-Assessment indicate that the originally assessed and newly assessed areas contain characteristics that promise greater potential success when combined with our better understanding. Integration of the past decade's experience with the developing methods and technology of today provide a reasonable assurance that sustainable, functioning wetlands are achievable on clay settling areas.

IV. RECLAMATION GUIDANCE CONSIDERATIONS

Clay Consolidation, Final Topography, and Other Soils

1. Use predictive methodologies as described in FIPR project # 94-03-1095, or other comparable methodologies (refer to Attachment II: Executive Summary)
2. Data required for these methodologies may include:
   A. Mine-specific clay consolidation parameters
   B. Clay deposition system characteristics
   C. Extent of overburden spoils
   D. Extent of unmined areas
   E. Extent of sand-tailings and/or mudballs
   F. Dam construction & materials content profiles

Hydrology

1. Use the predictive methodologies as described in FIPR project # 94-03-1095, or other comparable methodologies (refer to Attachment II: Executive Summary)
2. Use appropriately designed water control and outflow structures

Revegetation & Habitat

1. Design a vegetation plan that includes plant diversity, density, and planting schedule appropriate to the target community
2. Incorporate a phased planting schedule when appropriate

Monitoring

1. Incorporate into the reclamation/mitigation approval a monitoring program linked to project design objectives for hydrology and revegetation
2. Incorporate into the reclamation/mitigation approval release criteria appropriate to project design objectives including provision for review and corrective action as needed

Research, Development & Information Transfer

1. Encourage continued research and development of methodologies and technologies directed toward improved reclamation of Clay Settling Areas
2. Conduct annual Technical meetings with representatives of the phosphate mining industry, regulatory agencies, involved research investigators, and consulting firms

V. BIBLIOGRAPHY

1. **Cypress-Gum Ponds for Reclamation in Clay Settling Ponds** (B. Rushton / Univ. of Fla.-Center for Wetlands ~ Interim Report to FDNR-BOMR, April, 1986).

2. **Status Assessment of Reclaimed Clay Settling Areas with Forested and Herbaceous Wetlands** (J. Callahan, O. Rivera, B. Cates, FDNR, 1991).

3. **Hydrology and Water Quality of Unmined and Reclaimed Basins in Phosphate-Mining Areas West-Central Florida** (B. Lewelling & R. Wylie / U.S. Geological Survey, Water-Resources Investigation Report 93-4002, 1993).

4. **Managing Runoff Water Quality from Clay Settling Areas Used for Intensive Agricultural Production** (D. Haman, E. Hanlon, J. Stricker, D. Anderson, G. Gao / Univ. of Fla.-IFAS, and W. Reck / USDA-NRCS ~ Fla. Institute of Phosphate Research Project # 03-114-146, Draft Final Report, Nov. 1998).

5. **Hydrologic Data Summary of Four Reclaimed Clay-Settling Area Basins, Florida, 1995-98** (B. Lewelling & R. Mularoni / U.S. Geological Survey, Data-Summary Report 1999)

6. **Reclaimed Phosphate Clay Settling Area Investigation, Hydrologic Model Calibration and Ultimate Clay Elevation Prediction** (W. Reigner & C. Winkler / BCI Engineers & Scientists, Inc. ~ Fla. Institute of Phosphate Research Project # 94-03-1095, Final Report-Nov. 2000).

VI. ATTACHMENTS

1. **Status Assessment of Reclaimed Clay Settling Areas with Forested and Herbaceous Wetlands** (J. Callahan, O. Rivera, B. Cates, FDNR, 1991).

2. **Reclaimed Phosphate Clay Settling Area Investigation, Hydrologic Model Calibration and Ultimate Clay Elevation Prediction ~ Executive Summary** (R. Reigner & C. Winkler / BCI Engineers & Scientists, Inc. ~ Fla. Institute of Phosphate Research Project # 94-03-1095, Nov. 2000).

Attachment I

STATUS ASSESSMENT OF RECLAIMED CLAY SETTLING AREAS WITH FORESTED AND HERBACEOUS WETLANDS

J. Callahan, O. Rivera, B. Cates

Introduction

In recent months, discussions have centered on the need for a general evaluation of the design and performance of phosphate mine reclamation. As this reclamation enters its second decade, the overall environmental and reclamation knowledge bases have increased perceptibly. Status assessment relative to design methodology and reclamation performance is therefore necessary for continued advancement of proficiency. A subset of general reclamation includes that of above grade clay settling areas (CSAs) reclaimed all or in part to wetlands. This report pertains specifically to the study of this subset.

At the present time there are a total of twelve (12) above-grade, clay settling areas which are reclaimed to the point that revegetation is complete (IMC-P-3 contoured and naturally revegetated only). The revegetation has been completed for approximately four years in the oldest of these programs. Of the twelve (12) reclaimed CSAs, two are mandatory, two are combinations of mandatory and nonmandatory lands (hybrid), and the remaining eight (8) are nonmandatory. Below is a list of the twelve (12) CSAs assessed.

MANDATORY

1.	AGR-FG-SP(8)	Agrico/Ft. Green
2.	AGR-FG-SP(9)	Agrico/Ft. Green

MANDATORY/NONMANDATORY (Hybrid)

3.	IMC-P-2	(IMC-NP-061)	IMC/Phosphoria
4.	IMC-P-3	(IMC-NP-062)	IMC/Phosphoria

NONMANDATORY

5.	BDN-T-01/02	Tenoroc State Reserve
6.	BDN-T-03	Tenoroc State Reserve
7.	IMC-K-040	IMC/Kingsford
8.	IMC-K-041	IMC/Kingsford
9.	MCC-FM-02/03/04	Mobil/Ft. Meade
10.	MCC-FM-05(A)	Mobil/Ft. Meade
11.	MCC-FM-08(A)	Mobil/Ft. Meade
12.	WRG-BL-08/09/10/11	City of Lakeland/Bonny Lake

To facilitate this assessment, staff of the Bureau of Mine Reclamation, Mandatory Phosphate Section, met and devised a data collection worksheet. Background and historical information were obtained from application and inspection files, and by direct interview with bureau inspectors and company representatives. On April 2, 3 & 4, 1991, Janine Callahan and Orlando Rivera performed field surveys of all twelve (12) sites. Upon completion of the field surveys, staff met to discuss overall conclusions and results.

Discussion

Four (4) major parameters, relative to both design and performance, were identified which bear critical importance in the final outcome of clay settling areas, and most especially in clay settling areas with wetland reclamation. Reclamation design planning, construction and final outcome are highly dependent in this subset on the consideration of these interrelated parameters. The four (4) parameters identified are 1) nature of the clays and other soils within the site, 2) hydrology, 3) revegetation and site management, and 4) habitat objectives.

The nature of the clays and other soils within the site were observed for their extent and ability to interact adequately with hydrology, both as wetland substrate and watershed material. Also observed were the various soil natures relating to plant growth mediums. Factors pertinent to the above were further identified as: method and extent of dewatering, clay consolidation, presence and extent of sand tailings, location of sand tailings, presence of unmined areas, and presence of overburden spoils.

Hydrology and drainage objectives were evaluated for attainment of design goals and performance of actual construction. The interrelated edaphic factors (listed above) were considered in correlation with observed hydrologic and drainage conditions.

Revegetation was evaluated for initial stocking density and diversity. Obvious growth rates and growing conditions were observed, as well as significant changes in population structure or diversity. Revegetation factors were correlated with edaphic and hydrologic factors. Use or lack of site management was noted.

Habitat objectives were evaluated for attainment of design goals and for current condition/performance. Edaphic, hydrologic, vegetational, and management factors were correlated with habitat observations and conclusions were drawn.

(1) Clays and other soils

Due to the prereclamation condition of eight (8) of the twelve (12) sites studied, active dewatering of the clays was difficult. On these eight (8) sites, the presence of overburden spoils, sand tailings dumps, and heavy vegetation precluded the extensive use of mechanical dewatering. As a result, the clays exhibited wide variability in all of the factors considered important for good drainage and revegetation. Within these areas, difficulty in consolidating the clays resulted in further difficulty in adequately working with the sand and overburden.

On the four (4) sites which underwent passive and active (mechanical) dewatering, the clays exhibit the highest degree of consolidation and tilth; resulting in the highest degree of workability. Workability is defined as the capacity to support equipment, to be moved by equipment, plowed, disked, cultivated, and to provide sufficient upland substrate. Workability was observed to be directly proportional to the predictability and execution of postreclamation drainage.

(2) Hydrology

Natural wetlands are maintained by the interactions of a complex hydrologic regime. The base hydroperiod and water elevation of a natural wetland is influenced by contributions from direct rainfall, surface run-off, the surficial aquifer and intermediate aquifer. All of these sources, acting in concert, create and maintain the hydrology.

CSAs present a very different hydrologic regime. The clays form an impermeable barrier or aquiclude, preventing interaction between the clay surface and the surficial or intermediate aquifers. The elevated nature of the clays prevents waters of the surficial aquifer from running in over the lip of the clays, as would occur in the example of a natural cypress dome. In many cases, surface run-off from adjacent areas cannot contribute because of the elevated nature of the CSA. Contributions from sand tailings and overburden spoils within the CSA are currently indeterminable and are likely to be influenced by the final elevation of the clays. The effects of desiccation cracks within the clays, upon the attenuation/storage of surface run-off, is unknown at this time. The result is that most reclaimed CSAs present a restricted hydrologic system. Surface run-off is restricted to the watershed area within the CSA. The run-off characteristics in conjunction with the surface soil characteristics are currently unpredictable. Interactions with surficial and intermediate aquifers are eliminated or severely restricted. With the higher degree of soil workability exhibited in some of the observed CSAs, it is obvious that the temporary attenuation and drainage of surface run-off may be achievable. However, none of the examples demonstrated an ability to factor all the hydrologic variables and perform reclamation which assures the long-term viability of a wetland.

(3) Revegetation

According to historical records, the diversity and stocking rate of original plantings were performed to the standards of Chapter 16C-16 and 17, Florida Administrative Code (F.A.C.). As observed, however, a wide variability currently exists in both survivability and growth rates. Two main factors account for low survivability and growth. These two factors are the unpredictable hydrologic characteristics exhibited and competition from exotic and nuisance vegetation. Unpredictable and unreliable hydrology/drainage and exotic/nuisance competition correlate with the degree of soil workability.

(4) Habitat

The degree of attainment of planned habitat objectives is directly proportional to the current floral population density and diversity. Because of low to moderate rates of success for revegetation efforts, the floral communities are made up in large percentage by arrested stages of nuisance and exotic vegetation. Wildlife observations consisted, in most part, of the more cosmopolitan, opportunistic species (rodents, feral hogs, feral dogs/coyote, raccoon, opossum, armadillo, and some birds).

Conclusion

It is apparent from this study that although the current state-of-the-art in CSA reclamation is improving, much more knowledge must be gained before CSA reclamation will attain the overall requirements of Chapter 16C-16, F.A.C. Data collection, relative to all of the variable, hydrology-influencing parameters, is needed. The actions/interactions of surface soils, watershed area, watershed nature, associated aquifers, profiles, stratigraphies and influences of present non-clay soils will need to be understood further to accurately model and predict adequate hydrology for wetland maintenance.

Accurate, predictable clay consolidation appears as a key factor in achieving the overall reclamation goals. Central to predictable clay consolidation is the ability to dewater and achieve soil workability. Critical to effective dewatering is the construction and mine operations usage of the CSA in conjunction with the presence of sand tailings dumps, spoil rows, and unmined ground. This leads to the inevitable conclusion that, in order to achieve reclamation goals and rule requirements, the reclamation of CSAs must be integrally planned with their proposed construction and operational use.

Additionally, phosphate mining areas are large repositories for vast populations of nuisance and exotic plants. Mining and reclamation disturbances create optimum growth conditions for these plants, which in turn provide considerable competition for more desirable vegetation. Investigation into the methodologies of control of nuisance/exotic plants and maintenance/management of reclaimed areas is essential.

Of the reclaimed clay settling areas with wetlands in existence currently, very few present an observable inclination toward long-term wetland reestablishment and viability. In the majority of cases studied, "wetlands" resulted from working with, and sometimes enhancing, existing mined land scenarios. In order to develop a high degree of confidence that viable wetlands can be established on reclaimed clay settling areas, much more effort must be exerted in understanding hydrologic interactions, in designing and constructing clay settling areas pursuant to hydrologic interactions and reclamation goals, and in long-term management of reestablished vegetation.

CURRENTLY APPROVED MANDATORY CLAY SETTLING AREAS WITH WETLANDS[1]

PROGRAM	PROGRAM ACRES	UPLAND ACRES	WETLAND ACRES FOREST	WETLAND ACRES HERB.	U/W* RATIO
AGR-FG-SP(8)	555	383	70	102	2/1
AGR-FG-SP(9)	477	464	4	9	36/1
AGR-FG-SP(11)	696	576	0	120	5/1
AGR-FG-SP(12)	613	495	0	118	4/1
AGR-FG-SP(14)	587	522	0	65	8/1
AGR-FG-SP(15)	606	452	20	134	3/1
AGR-FG-SP(17)	386	294	1	91	3/1
AGR-FG-SP(18)	535	414	2	119	3/1
AGR-FG-83(2)	1,190	917	88	185	3/1
AGR-FG-84(2)	409	197	100	112	1/1
AGR-FG-84(7)	625	497	64	64	4/1
AGR-PC-SP(7)	443	368	0	75	5/1
AGR-PC-SP(8)	518	443	0	75	6/1
AGR-PC-84(1)	352	185	0	167	1/1
BP-L-SP(6)	138	79	22	0	4/1
GAR-FM-SP(08)	545	552	34	0	16/1
IMC-CS-PR(3A)	1,285	558	82	645	.8/1
IMC-CS-PR(7)	533	393	29	111	3/1
IMC-CS-PR(6)	475	223	83	169	1/1
IMC-CS-3C[2]	375	358	10	7	22/1
IMC-FC-HC(2)	1,517	1,283	0	234	5/1
IMC-H-LB(1)	693	636	47	10	11/1
IMC-K-BOG(1)	2,156	1,670	220	255	4/1
IMC-K-MC(1)	980	461	181	335	.9/1

PROGRAM	PROGRAM ACRES	UPLAND ACRES	WETLAND ACRES FOREST	WETLAND ACRES HERB.	U/W RATIO
IMC-K-SP(6)	556	260	52	244	.9/1
IMC-NP-HP(3)	687	667	20	0	33/1
IMC-NP-SMC(2)[2]	702	423	140	139	2/1
IMC-P-2[2]	413	341	72	0	5/1
IMC-NP-SP(8)	691	317	13	329	.9/1
IMC-NP-SP(9)	741	196	38	507	.4/1
AMX-BF-SP(1)	522	430	32	60	5/1
AMX-BF-SP(2)	218	133	20	65	2/1
AMX-BF-SP(3)	423	272	34	117	2/1
AMX-BF-SP(4)	406	473	15	45	8/1
MCC-FM-SP(1)	412	396	0	16	25/1
MCC-FM-SP(2)	670	612	7	44	12/1
MCC-FM-SP(3)	488	465	0	23	20/1
OCC-SC-3	450	367	83	0	4/1
OCC-SC-SP(1)	908	683	225	0	3/1
OCC-SC-SP(2)	1,372	1,072	300	0	4/1
OCC-SC-SP(3)	77	68	9	0	8/1
OCC-SC-SP(4)	379	283	96	0	3/1
OCC-SC-SP(5)	88	84	4	0	21/1
OCC-SR-SP(2)	655	290	365	0	.8/1
OCC-SR-SP(3)	647	457	190	0	2/1
OCC-SR-SP(6)	206	134	72	0	2/1
OCC-SR-SP(7)	287	217	70	0	3/1
OCC-SR-SP(8)	119	109	10	0	11/1
OCC*SR*8722	1,638	886	752	0	1/1
WRG-HP-1	1,258	0	0	1,258	0/1

PROGRAM	PROGRAM ACRES	UPLAND ACRES	WETLAND ACRES FOREST	WETLAND ACRES HERB.	U/W* RATIO
USS-R-(9A)	340	280	50	10	5/1
USS-R-SP(1A)	664	561	70	33	5/1
TOTALS	32,706	22,896	3,796	6,092	****
AVERAGES	629	440	73	117	****

(1) Acreage figures obtained from inspection data spreadsheets for the period ending December 31, 1990.

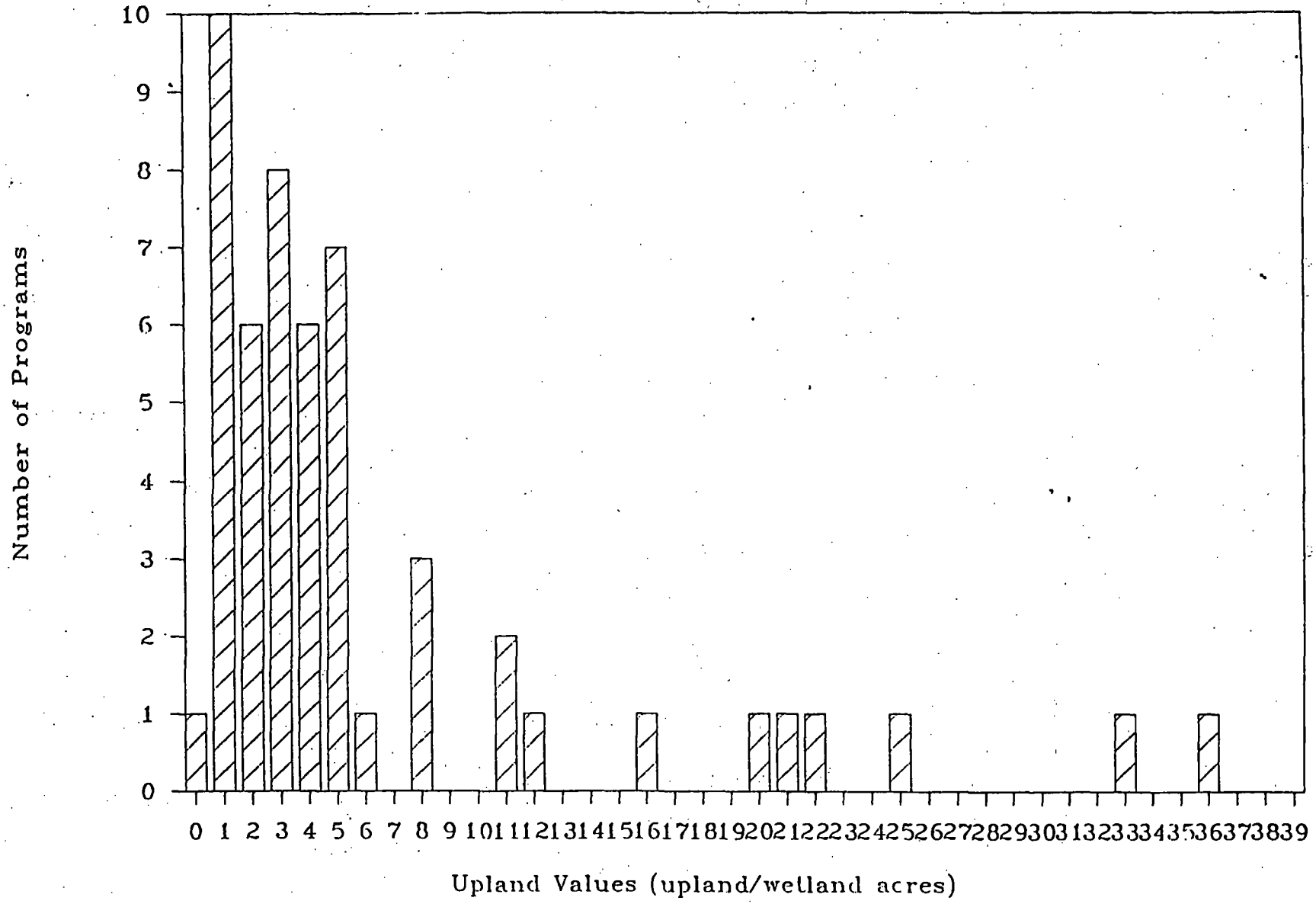
(2) Includes non-mandatory acreage figures in addition to (1) above:
IMC-CS-3C wetlands are mandatory
IMC-P-2 wetlands are non-mandatory
IMC-NP-SMC(2) wetlands are mandatory and non-mandatory

* Upland to wetland ratios are approximate. Numbers have been subjected to rounding to the nearest whole number, with the exception of programs where the wetlands are greater than the uplands.

*** Refer to Figure 1 (attached)

Range of Upland to Wetland Ratios

(Approved CSA's With Wetlands)



Attachment II

RECLAIMED PHOSPHATE CLAY SETTLING AREA INVESTIGATION HYDROLOGIC MODEL CALIBRATION AND ULTIMATE CLAY ELEVATION PREDICTION

FINAL REPORT

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EXECUTIVE SUMMARY

INTRODUCTION

Presently operating mines have over 60,000 acres of above ground Clay Settling Areas (CSAs) and approximately 20,000 acres designated for future CSAs. Current estimates indicate that 102,000 acres (160 square miles) of the Peace and Alafia River watersheds are comprised of CSAs. Within north Florida there are approximately 6,700 acres of active CSA's and 8,500 acres of proposed CSAs within the Suwannee River basin. This accounts for 10 to 15 percent of the combined total watershed above the following United States Geological Survey (USGS) stream gage monitoring locations: the Peace River at Zolfo Springs, the North Prong Alafia River at Keysville, and the South Prong Alafia River near Lithia. Restoring the hydrologic function of reclaimed settling areas is critical to establishing a viable hydrologic regime once mining and reclamation are complete. In addition, revegetation planning is crucial to the development and propagation of wildlife corridors and maintaining consistency with Integrated Habitat Network (IHN) concepts.

Approximately one-third of central Florida's phosphate matrix consists of fine-grained clay-sized materials that are able to pass through a minus 150-mesh screen. During the phosphate ore beneficiation process, the fine-grained material is separated from the coarse-grained sand and phosphatic material. The fine-grained material (clay) is pumped to above grade impoundments as a dilute slurry. Upon completion of clay filling, quiescent consolidation, and mechanical dewatering, the CSAs are typically reclaimed by flattening the outside slopes of the embankments, minor interior grading and shaping, and revegetation. Typical post-reclamation land uses include pasture, silviculture, habitat areas, row crops, and wetlands. Final reclamation also includes breaching the embankment and constructing an outfall to enable controlled surface water discharge.

This report presents the research objectives, work plan, and study results of a three-year research project designed to monitor and evaluate the hydrology and clay consolidation behavior of phosphate clay settling areas. The primary objective of the study is to develop a procedure for predicting the hydrology of above ground clay settling areas that directly considers the short and long term effect of clay consolidation. Problems associated with CSA behavior include:

- Difficulties in predicting hydrologic functionality
- Lack of confidence regarding the selection of model parameters
- Inability to accurately predict long-term topographic changes
- Uncertainty with regard to groundwater interaction
- Concern regarding optimal regulatory practices
- Concern associated with the time necessary to achieve CSA equilibrium

CLAY SETTLING AREA SITE SELECTION

Site selection was a joint effort among the Florida Institute of Phosphate Research (FIPR) Hydrologic Advisory Committee, USGS and BCI Engineers and Scientists, Inc. (BCI). The USGS and BCI provided a list of four recommended sites and monitoring plans for approval by the HAC. The four CSAs selected were:

- IMC-Agrico's Achan 10 (IMC),
- Estech General Chemical Company's SA-10 (Estech),
- Williams Acquisition Holding Company's AC-OP-06 (Williams), and
- PCS Phosphates White Springs' 10 SR (PCS Phosphate).

CLAY CONSOLIDATION

Accurately predicting the filling of a CSA has many benefits. By defining the tonnage capacity and fill date accurately, the construction and utilization of subsequent CSAs can be optimized. The benefits of accurate clay consolidation modeling extend to the dewatering and reclamation phases of CSA management. Accurately predicting consolidation during dewatering will help quantify target perimeter ditch invert elevations.

An analysis of post-reclamation consolidation behavior of phosphatic clays requires an understanding of the mine-specific clay characteristics. These characteristics were determined for each site from laboratory analyses of collected soil samples.

Highly plastic phosphatic clays consolidate at a very slow rate. Two physical parameters - compressibility and permeability, control the magnitude and rate of consolidation. Compressibility and permeability are non-linear and independently variable, and require the use of computer modeling programs to accurately simulate consolidation during clay deposition and subsequent dewatering and reclamation activities. Laboratory data were used to determine consolidation parameters for the Williams and Estech sites. Existing parameters were used at the IMC-Agrico and PCS Phosphates sites.

Computer models were used to estimate the tonnage of clay (in dry tons) deposited in each of the CSAs, predict quiescent submerged consolidation, and to determine the ultimate clay height (including the effect of the lowered post-reclamation water table in the clay). Topographic elevations based on aerial photogrammetric techniques were estimated at the Estech, IMC, and Williams CSAs in 1995, at the PCS Phosphates CSA in February 1996, at all the CSAs again in 1998. The measured average change in topographic elevations at the CSA was compared to the simulated change in the average elevation of the clay surface based on the soils description and history of the CSAs using the consolidation programs QSNS1 and ULTSIMP.

Measured elevations were from 0.8 feet at PCS Phosphates to 13 feet at Estech higher than simulated using QSNS1 and ULTSIMP. The best prediction of the clay elevation and rate of elevation change was made for the PCS Phosphates site. These excellent results are due to the accurate modeling input data for the site. For PCS Phosphates, the CSA geometry and filling history are more accurately known than for the other CSAs, and the model representation of clay characteristics have been calibrated during periodic clay sampling and testing over the past 15 years.

Estech is a small atypical CSA that was filled in the 1970s. Since then the mine has shut down and the mining company no longer exists in Florida. Physical and temporal data used in the consolidation modeling was based on the best information available and the model-simulated results were relatively poor due to the relatively limited data available to describe this CSA.

Measured rates of average elevation change varied from 0.1 feet/year at Estech to 0.9 feet/year at PCS Phosphates. The IMC and Williams sites both had 0.3 feet/year rates of measured elevation change. The Estech site, with the smallest drop in elevation, was the only site reclaimed and trafficable by foot at the start of the project. The IMC and Williams sites had both been filled for over 14 years and were completing the dewatering phase during 1995. These two sites had moderate rates of elevation change – 0.3 feet/year. The largest rate of elevation change was measured at the PCS Phosphates site that had been filled three years prior to commencement of our study. Our method of estimating elevation change after reclamation may be more suited to relatively new sites and not ones that remained in an unreclaimed state for more than a decade.

The timing and magnitude of consolidation at release from the Florida Department of Environmental Protection (FDEP), and ultimate consolidation, have significant impacts on the accuracy of post-reclamation hydrologic predictions. Storage volume below the discharge structure invert elevation increases most rapidly immediately following dewatering, and the rate of increase slows with time. Incorporating the following steps into the modeling procedures will increase the accuracy of CSA elevation predictions.

1. Quantify CSA geometry prior to clay deposition via photogrammetry or survey data.
2. Monitor the fill height and clay tonnage during the active life of a CSA.
3. Develop mine-specific consolidation parameters and calibrate them periodically.
4. Obtain clay elevation topographic information at the start of dewatering activities.
5. Re-establish the clay elevation when the CSA is released by the FDEP.
6. Base ultimate elevation estimates on the most accurate information available.

Utilizing the most accurate input data will facilitate accurate post-reclamation clay elevation predictions. Accurately predicting the clay elevations will aid in proper placement of wetlands and uplands and restoration of viable post-reclamation hydrology.

MICROTOPOGRAPHY

Topography elevations were measured during this investigation at one to six inches apart within several areas of 60 inches^2 within each of the CSAs. This data was analyzed for possible changes in microtopography within the CSAs. These measured elevations provide a characterization of the measured areas, though these data did not provided a measure of depressional storage at the CSAs or a better understanding of the size and extent of cracks within the CSAs.

USGS COLLECTED DATA

As part of this cooperative investigation, the USGS collected hydrologic and climatic data for a 2-year period at each CSA. Data collected during the period from September 1996 through September 1997 were common to all study areas. The data collection network at each site included: stream flow, pond stage, periodic and continuous recording water levels in wells, rainfall, wind speed and direction, water temperature, relative humidity, air temperature, and pan evaporation.

At each of the four CSAs, streamflow and pond-stage data were collected by electronic data-loggers that recorded water-level elevations in a stilling well from the rising and falling of a float. Discharge at each basin was monitored by a streamflow gage at the outfall of each CSA. One to three water level stage gages were installed in each basin to monitor pond fluctuations. The relationship between stage and discharge at the outfall(s) of each CSA was determined via field measurement. Monitoring data collected by the USGS was used to estimate the water balance at each CSA and to calibrate and verify the hydrologic models used in this investigation.

HYDROLOGIC MODELING

An objective of this investigation is to provide estimates of hydrologic model parameters suitable for representing the hydrology of CSAs based on calibration and comparison with collected monitoring data. Several public domain and proprietary computer programs were selected for use in replicating the hydrology of the four reclaimed CSA's monitored during this investigation. Models were generally selected based on their popularity in predicting the hydrologic behavior of CSAs. The models are divided into two groups: models that are used to simulate a single rainfall event (event simulations), and models that can simulate multiple rainfall events with periods of no rainfall between the events (continuous simulations). Values compared in the calibration include:

- Total Discharge (percent difference between simulated and observed)
- Peak Discharge (percent difference between simulated and observed)
- Time of greatest Peak Discharge (difference in hours)
- Mean Error (differences between simulated and observed discharges and stages)
- Mean Absolute Error (absolute value of the differences between simulated and observed discharges and stages)

The calibration process also included a sensitivity analysis. If parameters were selected such that the statistics listed above did not significantly improve with small changes in the parameter values, then the model was assumed to be calibrated. After the model calibration and sensitivity analysis was concluded a second independent event was selected for use in verifying model parameters.

Since there were few rain events for use in calibrating the event models, BCI developed a program based on Soil Conservation Service (SCS) methods to estimated the curve number for a site using long-term observed rainfall, ground water stage, and discharge (i.e., a volumetric calculations of curve number). Using this program, rainfall events were defined as having a minimum 12-hour inter-event period, and the maximum groundwater storage potential was assumed to be a function of the observed water table depth below land surface. The difference between the cumulative simulated and observed discharges was minimized by adjusting the effective soil storage capacity above the water table.

The single event calibrations and verifications conducted for the CSAs indicate that the single event models included in this investigation are generally not robust enough in their calculation methodology to predict the response of a system as dynamic in nature as a CSA. The word "Predict" is used here to describe the ability of a model to simulate an observed response to a specific rainfall event given the physical characteristics of the basin, the rainfall event size and distribution, and various assumed parameter values.

During this investigation, parameters estimated through calibration did a poor job of estimating discharges from a CSA for rainfall events selected for verification. This indicates that:

- Field monitoring is needed to guide adjustments to model parameters and/or interpretation of model results and to ultimately allow for adjustment of the CSA outfall configuration.
- Improved estimates of clay consolidation are needed to more accurately estimate changes in storage within CSAs.

If the model objectives are to prevent downstream flooding, then the event simulation models may be useful with the proper selection of model parameters, since they can provide an estimate of discharge from the CSAs that are generally conservative (i.e., overestimated) based on standard engineering assumptions. Furthermore, event based model results are generally utilized in a comparative mode – pre-mining versus post-reclamation such that the absolute prediction of event-based performance is not necessarily required. Rather, the goal is to design a post-reclamation landform that exhibits predicted hydrologic performance that is similar to "predicted" pre-mining conditions. The problem with this strategy is that the long term post-reclamation discharge volumes, based on event model design criteria, will most likely not match pre-mining discharge characteristics.

The curve numbers estimated during calibration were lower than expected for the relatively impermeable clays with larger than average (as compared to the pre-mining landscape) hydrologic slopes. The curve number varies with antecedent moisture conditions, and the low curve numbers may indicate dry antecedent moisture conditions. During these conditions, storage capacity within the cracks in the clay may be quite large. This storage component is not directly included in the lump parameter models that utilize curve number methods. However, in the distributed parameter models (SWMM and HSPF), the depressional storage component can be adjusted to account for this storage.

For the CSAs, some system parameters, which, for other systems, might be considered immutable, change drastically with time. These changes are caused by clay consolidation and subsequent clay cracking, surface subsidence, and revegetation that occur over many years. Changes that were incorporated in the models include depressional storage, slope, and pond storage. The model simulations indicate significant alteration in system hydrologic response caused by these changes. It seems an appropriate strategy would include system controls that can be modified over time to optimize hydrologic function. In addition, the wide range of parameters needed to describe the observed hydrology indicates an undetermined level of uncertainty in accurately predicting the hydrologic response of a CSA, particularly during the design phase of reclamation when little data exists to validate assumptions.

COMPARISON TO PREVIOUS RECLAMATION ANALYSES

When comparing actual reclaimed landforms with designed landforms the interiors of the CSAs appear wetter than expected. In addition, there seems to be less discharge from the CSAs than anticipated. This observation could indicate greater storage within ponds, depressions and cracks of the CSA then was assumed in the design. This observation also validates the impact associated with long-term consolidation of clays and the related gain in available water storage.

Present DEP guidelines used for permitting CSAs require that:

- Post-reclamation discharge volumes not exceed by more than 5-percent, nor less than 85 percent, of pre-mining discharge volumes as simulated for the 25-year return storm event.
- Post-reclamation peak discharges not exceed the peak discharge for pre-mining conditions as simulated for the 25-year return storm event.

To meet these guidelines, actions are usually taken to reduce the discharge from CSAs based on the assumption that clays are impermeable and would normally discharge more than pre-mined systems. These actions usually decrease the long term discharge from these areas as compared to conditions prior to mining.

FEASIBILITY EVALUATION

In this section, a description of several outfalls (channels, weirs, and box/drop inlets) at existing CSAs is provided. Also provided is a list of alternative outfall configurations for consideration including: adjustable controls, gravel berms, sediment sumps, vertical grade transitions, vertical chimney drains, ring drain, and wetland treatment areas. Since the topographic and vegetative characteristics of a CSA change with time, structures, that can be modified, or modification of existing structures, may be required to preserve long-term hydrology. Recommendations are also provided for better estimating the change in topography within the CSAs.

GUIDELINES AND RECOMMENDATIONS

Depressional storage volume below the discharge structure invert elevation increases rapidly immediately following the initiation of dewatering activities, and the rate of depressional storage increase is reduced with time. Rates of decrease in average clay elevation change were up to about one foot per year during the 2.4 years between mapping efforts at the PCS Phosphate site. Incorporating the following data into the modeling procedures of CSAs during their active life, dewatering and reclamation will improve the accuracy of CSA elevation predictions and subsequently the ability to predict hydrologic performance.

- Quantify CSA geometry prior to clay deposition via photogrametry or survey data.
- Monitor the fill height and clay tonnage during the active life of a CSA.
- Develop mine-specific consolidation parameters and calibrate them periodically.
- Obtain clay elevation topographic information at the start of dewatering activities.
- Re-establish the clay elevation when the CSA is released by the FDEP.
- Base ultimate elevation estimates on the external surficial aquifer water table using the most accurate data gathered during the life of the CSA.

Utilizing accurate input data, backed up with confirmation during the filling and dewatering phases, will maximize the accuracy of predicted post-reclamation clay elevations. Accurate clay elevations will aid in proper sizing and invert elevation selection for outfall structures.

Several factors that generally limit the ability of hydrologic models to accurately and consistently predict the hydrology of CSAs include:

- Inaccuracies in predicting the topography of a CSA during the reclamation design phase. Even in the unlikely event that detailed aerial topographic maps are available at select intervals, the inaccuracies involved are still very significant.
- Continued changes in topography caused by clay consolidation and variations in these changes between and within CSAs;
- Long-term changes in depressional storage and frictional characteristics caused by consolidation and clay cracking; and,

- Inaccuracies in determining if cracks in the clay contact underlying overburden mounds and how these might change through time with regard to their hydrologic significance.

In general, the factors listed above result in an underestimation of detention and retention, and overestimation of peak discharge and total discharge volumes. That is, by reducing peak discharges the designed systems do not often maintain the volume and character of long-term discharge that occurred prior to mining. There is a need for model(s) that accurately predict changes in the topography within the CSA (i.e., cell-by-cell) to provide a more accurate estimate of change of storage within the CSA.

The Recommendations Section of the report provides a sequential methodology for improving the post-reclamation hydrologic functionality of CSAs. In summary, the methodology is as follows:

1. Document the pre-fill topography for each CSA.
2. Collect and refine consolidation parameters, tonnage and filling history.
3. Determine the clay surface topography prior to dewatering.
4. Develop end-of-fill clay thickness map from pre- and post-fill topographic maps.
5. Conduct clay modeling – develop relationship between clay thickness and consolidation.
6. Apply relationship to clay thickness map to generate a predicted post-reclamation clay surface topographic map.
7. Utilize the post-reclamation topographic map as a guide in defining grading/earthmoving, revegetation, and drainage plans.
8. Conduct coarse level modeling to establish preliminary outfall geometry and invert elevation.
9. Complete earthmoving and revegetation activities.
10. Develop as-built topographic map and compare to post-reclamation topographic map - refine as necessary.
11. Review and refine as necessary the event-based hydrologic model.
12. Install preliminary outfall and develop stage/discharge relationship.
13. After several years initiate coarse level hydrologic/meteorological monitoring.
14. Revisit hydrologic analyses – Refine event-based (25-year return interval) model.
15. Evaluate long-term functionality utilizing continuous or small magnitude event-based analyses.
16. Adjust outfall configuration and invert elevation as necessary to optimize and balance flood protection and baseflow reestablishment.